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THE PROBLEM OF HIGH BLOOD PRESSURE IN MAN*

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The question to be discussed here is central to the whole problem of human hypertension—namely, the nature of the agent raising the arterial pressure. Until we understand this no other question can be answered fully and satisfactorily. At the outset it is well to have clearly in mind the possibility that hypertension may originate differently in different clinical conditions. The following discussion will centre round so-called essential hypertension, but acute and chronic nephritis and coarctation of the aorta will be mentioned briefly.

Vasoconstriction

In all the maladies mentioned we may say that the rise in mean arterial pressure is due to vasoconstriction, for the other possible factors—raised cardiac output and increased blood viscosity—have been excluded by direct measurement. We do not yet know whether this vasoconstriction affects equally all vascular areas or some territories to a greater extent than others; but the evidence supports the idea that it is more or less uniform. Thus, if vasoconstriction affected some vascular territories more than others we should expect blood to be diverted from vessels that were more, to those that were less, constricted. We might therefore expect symptoms of ischaemia to arise from organs whose vessels were particularly narrow. Such symptoms are uncommon in the early stages, and when they occur in the later or more severe cases they are, in my opinion, nearly always due to local organic vascular disease. I am dissatisfied with the evidence for the view that so-called hypertensive encephalopathy is due to arterial spasm: hypertensive neuroretinitis may be, but the question of its origin is complex (Pickering, 1933–4) and the vascular territory small.

The normal blood-flows through the forearm recorded in chronic nephritis and essential hypertension by Prinzmetal and Wilson (1936) and by myself (Pickering, 1935–6b) support the conception of a generalized vasoconstriction, but the measurements perhaps require repetition in view of the recent demonstration by Grant and Pearson (1937–8) that the forearm plethysmograph used in both sets of observations receives not only blood entering the forearm from the arterial side but also blood returning through the veins from the hand.

On general grounds we would suspect that the vessels chiefly constricted in hypertension would be the small arteries and arterioles where the main vascular resistance lies. This idea is supported by the normal values for capillary pressure found by Ellis and Weiss (1929–30) in essential hypertension and by the normal pressure gradient between brachial and digital arteries found by Oppenheimer and Prinzmetal (1937).

Nature of Agent Constricting the Vessels

It is probable that the disturbance underlying persistent hypertension in man is a more or less uniform narrowing of the small arteries and arterioles. Clearly there are three ways in which such narrowing might arise—namely, from a morphological change in the vessels, or from vasoconstriction of nervous or of chemical origin. It is well recognized that anatomical changes in the small arteries and arterioles are almost invariable in long-standing cases of hypertension. In both chronic nephritic and essential hypertension fatty hyaline intimal thickening of these vessels occurs, usually in the kidney, and sometimes in other abdominal viscera and in the brain. But these changes are absent, or nearly so, from the large vascular territories of skin and muscle, in which regions the media is usually hypertrophied (Fahr, 1922; Fishberg, 1925, 1927; Kernohan, Anderson, and Keith, 1929). Most of those who have studied the histology hold that the intimal change in hypertension is not sufficiently widely distributed to account *per se* for the rise in pressure, and that the medial change represents a work-hypertrophy of the arterial wall analogous to that occurring in the heart. The indication from histological work that the vascular narrowing responsible for raised arterial pressure is a functional rather than an anatomical change is in accord with experimental observations suggesting that in human hypertension the vessels are capable of considerable dilatation. Thus, in the arm the vasodilator responses to circulatory arrest and to heat are of normal size in human hypertension (Pickering, 1935–6a, 1935–6b). Again, a vasodilator agent such as histamine produces in chronic nephritis and essential hypertension falls of arterial pressure that are similar to those in normal subjects when allowance is made for different initial pressures (Pickering, Kissin, and Rothschild, 1935–6).

So far in our argument there is fairly general agreement among different workers. The chief cleavage comes when we consider whether the abnormal vasoconstriction responsible for raised arterial pressure is due to overaction of the vasomotor nerves or to a chemical factor. In considering these rival hypotheses it is of great importance that we have a clear conception as to the question at issue. In the normal subject the blood pressure is maintained by the state of contraction or tone of the vessels taken as a whole. Normal vascular tone is undoubtedly in part of nervous origin, as is demonstrated by the vasodilatation which follows section of the sympa-

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thetic nerves, and by the profound fall of blood pressure which occurs when the spinal cord is destroyed. Completely denervated vessels are not, however, fully dilated, and it is probable that normal vascular tone is partly also of chemical origin. If we agree that normal vascular tone is partly of nervous and partly of chemical origin, then we must assume that vascular tone in hypertension has at least these two components, and what we have to find out is which of the two is abnormal. To prove that hypertension is due to vasoconstriction of nervous origin it is clearly not enough to demonstrate vasomotor nervous tone; it must be shown that this is excessive. Similarly, to demonstrate the chemical origin of hypertension an increase must be shown in the chemical component of vascular tone

Evidence for the Nervous Hypothesis

With these considerations in mind let us examine the evidence that has been advanced for the nervous hypothesis. One of the most complete hypotheses for the origin of hypertension was that due originally to Hering (1927) and later supported by Mies (1932) and Regniers (1930), and which supposed that the raised pressure was due to interference with the carotid sinus and aortic reflexes. This hypothesis is now generally abandoned, since it has been demonstrated that the carotid sinus reflex functions in hypertension (Gammon, 1936; Pickering, Kissin, and Rothschild, 1935–6), and since the hypertension produced in animals by section of the carotid sinus and depressor nerves differs considerably from that found in man. A second hypothesis put forward by Raab (1929) and others was that essential hypertension was due to ischaemia of the medulla and consequent increased irritability of the vasomotor centre. Raab's evidence has been partly though not wholly controverted, but his idea has won no general acceptance chiefly because the respiratory centre seems much more sensitive than the vasomotor centre to changes in gas content of the blood.

Those who now uphold the nervous hypothesis do not specify the way in which over-activity of the vasomotor nerves is brought about. They rely for their support mainly on the evidence derived from the cold pressor test and from the effects of dividing the sympathetic supply to the abdominal viscera. Hines and Brown (1932) consider that an unusually large rise of blood pressure in response to immersing one hand in water at 4° C. is characteristic of essential hypertension; a few subjects with normal blood pressure may show an equally large response, but these usually have a family history of hypertension and are regarded as potential or future sufferers from the disease. Hines (1937–8) has recently emphasized the significance of this test by showing that in families having a large response to cold hypertension is common, while in those having a small response hypertension does not occur. On the other hand, Kissin and I (Pickering and Kissin, 1935–6) found that a large response to cold was not peculiar to essential hypertension, being occasionally absent in the condition and sometimes present in subjects of comparable age with normal pressures and no family history of the disease; our series of patients was, however, small. Whether or not an exaggerated response to cold is peculiar to essential hypertension is a question of fact which will ultimately be decided by observation; purely for the purposes of argument, let us assume that it is so and consider its interpretation. The rise of blood pressure in response to cold is almost certainly due chiefly to vasoconstriction of nervous origin; an unusually large rise may be due to an enhanced irritability of the vasomotor centre, as Hines and Brown suppose, but it might also be due to enhanced irritability of the peripheral vessels, or to a diminished sensitivity of the proprioceptive mechanisms regulating blood pressure, which would allow an unusually great change in pressure to occur. As evidence for the nervous origin of essential hypertension the cold pressor test is thus by no means unequivocal.

In considering operations for denervating the splanchnic area it is important to distinguish the therapeutic from the scientific implications of the results obtained. The operations, largely introduced by Adson and his colleagues, are of two kinds—section of the anterior spinal roots from about the sixth thoracic to the second lumbar, and section of the major and minor splanchnic nerves above or below the diaphragm with removal of the adjacent sympathetic ganglia—and there seems to be no doubt that they are successful as therapeutic ventures in certain cases. These two operations seem to produce similar effects on the arterial blood pressure in essential hypertensives (Allen and Adson, 1937–8; Freyberg and Peet, 1937; Page and Heuer, 1937); in some patients the fall of blood pressure is profound and persistent; in most a considerable fall is ultimately followed by a return to approximately the pre-operating level; and in a few the blood pressure is unaltered. The variability of the results obtained and the insufficiency of the control series make the interpretation of these results extremely difficult. From general considerations, and from the effects of similar operations on normal dogs (Grimson, Wilson, and Phemister, 1937) and on dogs with hypertension originating chemically from renal ischaemia (Goldblatt, Gross, and Hanzal, 1937), we may interpret those results in which a variable post-operative fall is followed by a return to the pre-operative level of arterial pressure as meaning no more than that normal vasomotor nervous tone has been removed from the splanchnic area. In those instances where the blood pressure returns permanently to normal this explanation may be insufficient, and we may suspect either that the hypertension was due to excessive vasomotor nervous tone, or that splanchnic denervation has produced its effects in an indirect manner such as by increasing the blood-flow through a previously partly ischaemic kidney. If this latter explanation were correct we should expect similar results to follow simple renal denervation; but this operation has not yet been performed on a sufficiently extensive scale.

Evidence for the Chemical Theory

The interpretation of changes in blood pressure due to experimental interference is rendered hazardous by the complexity of the factors involved. It occurred simultaneously and independently to Prinzmetal and Wilson (1936) and to me (Pickering, 1935–6b) that the question of the nervous or chemical origin of hypertension could be settled by the following simple experiment. In any organ the blood-flow is proportional to the perfusing pressure divided by the resistance offered by the vessels. In persistent hypertension the blood-flow through the upper extremity seems to be normal—that is to say, the increased perfusing pressure is balanced by increased vascular resistance. Supposing that we completely remove vasomotor nervous tone from the vessels of the hand, then if the abnormal factor constricting the vessels is nervous it should disappear under these circumstances and blood-flow through the hand would be greater in the hypertensive than in the normal subject, since increased arterial pressure would no longer be balanced by increased resistance. If, however, the abnormal factor is not nervous, then it will not disappear with the removal of vasomotor

nervous tone: increased blood pressure will still be balanced by increased resistance, and in hypertensive patients blood-flow may be no greater than in normal subjects under comparable circumstances. To measure blood-flow Prinzmetal and Wilson used Hewlett and Van Zwaluwenberg's plethysmographic method with Lewis and Grant's forearm plethysmograph, reference to which has already been made. I used Stewart's calorimetric method on the hand as an index of its blood-flow, removing vasomotor nervous tone from the hand by raising the body temperature. Evidence was obtained that the calorimetric method provided a reliable index of blood-flow and that the degree of body warming employed was sufficient to remove entirely vasoconstrictor nervous tone from the hand. As regards essential, malignant, and chronic nephritic hypertension we agreed in finding normal blood-flows after removing vasomotor nervous tone.

In these conditions, therefore, the experiment suggests that the abnormal factor in the peripheral resistance is not nervous and is presumably chemical in origin. In coarctation Prinzmetal and Wilson found abnormally large flows and I found normal flows. Several possible reasons for this discrepancy may be advanced, but these have not as yet been investigated. I was forced to conclude that the increased resistance in the upper limb in coarctation was also of non-nervous origin. On the other hand, in four of six cases of acute nephritis in the hypertensive phase I did find increased flows through the hand from which vasomotor nervous tone had been removed, and the increase was of the order to be expected from a simple increase in arterial pressure. In these cases, therefore, there was no evidence of non-nervous vasoconstriction in the hand during the hypertensive phase, a result consistent with hypertension being due to vasoconstriction of nervous origin. As yet no pressor reflex mechanism has been demonstrated from the kidney.

To return to essential hypertension, the suggestion from these experiments is that the raised blood pressure is of chemical origin. A pressor substance has often been sought in the blood, but experiments in which extracts or ultra-filtrates of blood are tested and found negative are all open to the interpretation that the pressor substance was present in the discarded fraction. Accordingly I measured the changes of blood pressure produced in anaemic patients receiving blood from normal donors and from donors with essential hypertension (Pickering, 1935–6a). No appreciable rises of blood pressure occurred even when 600 c.cm. of blood from a hypertensive donor was introduced in six minutes. Prinzmetal, Friedman, and Rosenthal (1936) made similar observations in malignant hypertension, and found no pressor response from transfusion of as much as 2,300 c.cm. of blood from a hypertensive donor. It is evident, therefore, that if a circulating pressor substance exists in benign and malignant hypertension it is present in surprisingly small quantities. If the chemical theory is correct, then the agent would appear to be one which is relatively stable in the body and which is fixed by the vessels on which it acts. The strongest clues point to the kidney as a possible source of such a pressor substance. Thus in chronic nephritis there are many reasons for supposing that the kidney is the seat of the primary disturbance which results in hypertension. Again, Goldblatt, Lynch, Hanzal, and Summerville (1934) have shown that a persistent hypertension, which resembles essential hypertension in the maintenance of a relatively normal renal function, may be produced in the dog by constricting the renal arteries. More recently Goldblatt (1938) has shown that when the constriction is severe, albuminuric retinitis, arteriolar necroses, and renal failure occur as they do in the malignant phase of human hypertension. Wilson and I (1937–8) have also reported the occurrence of widespread necrosing arteriolar lesions in rabbits with severe hypertension from renal artery constriction. From these observations there is no doubt that something very similar to the benign and malignant phase of essential hypertension may be produced in animals by renal artery constriction. And there is little doubt that this experimental hypertension is chemical and not nervous in origin. Finally, Moritz and Oldt (1937) have produced histological evidence suggesting that renal arteriolosclerosis is the primary lesion in essential hypertension.

The question arises, Are essential and chronic nephritic human hypertension due to the release into the circulation of a chemical substance by the kidneys, and perhaps its subsequent fixation by the vessels? We know that a protein-like pressor substance is a normal constituent of the renal cortex. It was described by Tigerstedt and Bergman (1898). The failure of many workers to find it is probably due chiefly to its action being reduced or abolished by anaesthetics (Pickering and Prinzmetal, 1937–8). Whether this substance is concerned in the production of experimental or human hypertension is a question which it is as yet unprofitable to discuss, but there is no doubt that evidence for or against the hypothesis will accumulate in the near future.

Conclusion

In this account I have attempted to develop a line of thought rather than to prove a scientific hypothesis. Proof will not come until we can demonstrate in detail the mechanism whereby the arterial blood pressure is raised in man. But in looking for such a mechanism we must have some guide, and it seems to me that on the available evidence the most profitable line to explore is that which I have tried to indicate here.

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PROLONGED INJECTIONS OF MALE SEX HORMONES INTO NORMAL AND SENILE MALE RATS

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An investigation of the effects of prolonged treatment with male hormones of normal—that is, non-castrated—and especially senile, animals has not only theoretical but great practical interest. The majority of patients undergoing treatment with male hormones possess gonads, although usually in an impaired functional condition and often with anatomical changes. Seniles are considered to be especially suitable patients, following the publications of Brown-Séquard (1889a, 1889b), later corroborated in a different way by Steinach's (1912, 1920) experiments on the ligation of the vasa deferentia, and the observations of Voronoff (1923, 1924, 1926) on the effects of testicular grafts.

In spite of the contradictory and often disappointing results of other workers (reviewed by Korenchevsky, 1925; Romeis, 1931a; Sand, 1933) on the effects of these treatments, experimental and even clinical evidence suggests that the internal secretion of the gonads has some significance in the pathology of senility. It is also important to discover whether the sex hormones have any toxic effects, especially as many clinicians are using large doses in their attempts to obtain desired results. Therefore, now that pure sex hormones are available, an investigation into their possible favourable and toxic effects, in particular on senility, is urgently required.

Technique

When interpreting the results obtained in the present investigation it is necessary to take into consideration the following conditions of the experiments. The senile rats used did not belong to the same litter, but were taken from the stock at the Institute, and were known to be about 14 to 18 months old at the end of the experiment. At this age the inbred rats of our stock show definite signs of senility.

TABLE I.—*The Effect of Male Sex Hormones on Weights of Some Organs of Senile Male Rats*

Group:	I	II	III	IV	V
	Rats Injected Weekly with				
	Oil (Control Rats)	Androsterone 7.5 mg.	Dehydroandrosterone 7.5 mg.	Testost. prop. 0.75 mg.	Testost. prop. 7.5 mg.
Testes (gm.)	3.08	2.28	2.63	2.00	2.02
Seminal vesicles (gm.) ..	1.56	1.40	1.43	2.02	3.35
Prostate (gm.)	1.80	1.74	1.69	1.85	2.64
Penis (mg.)	483	449	407	441	459
Preputial glands (mg.) ..	268	230	208	267	295
Thymus (mg.)	187	149	145	117	36
Liver (gm.)	16.72	15.84	14.13	11.80	13.66
Abdominal fat (gm. ..	34	32	27	28	24
Final body weight (gm.) ..	551	477	449	424	454
Gain in body weight (gm.)	68	68	2	1	25
No. of rats in group ..	4	4	4	4	4
No. of rats with pneumonia	3	3	2	4	1

Chronic pneumonia occurs in varying degree in nearly all senile rats, and is produced by a germ which is at present unknown. The disease occurred in a mild form in every group of senile rats, as indicated in Table I, but all rats suffering from severe pneumonia and falling in weight have been excluded from the experiments. The difficulty in obtaining large numbers of senile rats, the fact that they come from different unknown litters, and the possibility of some changes due to pneumonia made it necessary for us to corroborate some of our results obtained on old rats by experiments on younger normal rats with an average final age of 137 to 174 days. These rats belonged to known litters, and the litter-mates were so far as possible equally divided among the different groups (Table II).

TABLE II.—*The Effect of Male Sex Hormones on Weights of Some Organs of Adult Male Rats (Average Age 138 to 174 Days)*

Group:	I	II	III	IV	V	VI	VII
	Control Rats (Oil-injected)		Androsterone 7.5 mg.	Testosterone		Testost. prop.	
	Age 165 Days	Age 138 Days		0.75 mg.	7.5 mg.	0.75 mg.	7.5 mg.
Testes (gm.) ..	3.03	2.98	1.64	2.91	2.16	1.67	2.48
Seminal vesicles (gm.)	1.41	1.23	0.87	1.55	1.42	1.49	2.96
Prostate (gm.) ..	1.49	1.23	1.11	1.53	1.33	1.67	2.29
Penis (mg.) ..	370	334	302	372	368	395	472
Preputial gl. (mg.)	134	95	141	137	111	117	200
Adrenals (mg.) ..	55	52	42	58	55	57	55
Thymus (mg.) ..	293	274	240	258	234	183	108
Liver (gm. ..	14.63	13.18	11.76	13.74	14.48	12.95	11.81
Abdominal fat (gm.)	34	30	32	33	31	25	24
Final body weight (gm.)	483	413	390	464	425	413	395
Gain in body weight (gm.)	288	358	330	235	196	362	159
No. of rats in group	7	5	4	5	4	3	3
Average age of rats	165	138	144	162	162	137	174

Note.—The data of cols. III and VI have to be compared with those of the control rats of similar age (137 to 144 days) given in col. II; the data in cols. IV, V, and VII (average age 162 to 174 days) with the control data in col. I. The doses given are weekly.

The pure hormones, supplied by Messrs. Ciba Ltd., were dissolved in sesame oil. Five times a week 0.2 c.cm. of the hormonal solution was injected in the doses given in Tables I and II, the control rats receiving pure sesame oil. The organs were fixed in Bouin's solution. They were then weighed and for histological investigation were embedded in paraffin, or frozen sections were cut and stained for lipoid and fat with scharlach red. The sexual organs, hypophysis, adrenals, thyroids, liver, and kidneys have been examined by weight and histologically; the thymus, spleen, and heart by weight only. Other details of our experimental technique were the same as those described in our previous papers (Korenchevsky, 1937; Hall and Korenchevsky, 1938a).

Experimental Observations

The experiments were performed on a total of sixty-three rats; of these, twenty senile (Table I) and thirty-one adult male rats (Table II) were injected for a period of 90 to 118 days. The results were compared with those obtained on twelve senile rats—six controls injected with oil and six rats injected daily with 0.9 mg. of androsterone for twenty-four days only. The latter results are

not given in a separate table as they were similar to those of 118 days' duration. The arrangement of the prolonged experiments is clear from the tables: for economy of space only those organs in which changes occurred have been included. Similarly the weights per unit of body weight have not been tabulated, but, where necessary, are referred to in the text. Since the results obtained on both senile and adult rats were very similar, they will, so far as possible, be discussed together.

External Appearance and Behaviour of the Rats

Senile Rats.—As compared with normal adult rats they have lost the agility, curiosity, and sexual activity of young or adult rats; usually they sit inertly in their cages and are indifferent to their surroundings; their fur is rough and dirty; their skin covered with insects, as they do not clean themselves; and they develop obesity if they do not suffer from a severe form of pneumonia. Because, however, all rats with severe pneumonia were excluded from the experiment, and because of the great care taken in their feeding (Hall and Korenchevsky, 1938a) and keep, our senile rats were not small, extremely emaciated animals, as are those represented in the photographs of some other workers on senile rats. In spite of the features of senility described above, they were large, well-nourished animals with an average weight of about 550 grammes. The condition of their sex organs was also comparatively good, as dissection and histological investigation of the control rats showed. The injections did not noticeably affect the appearance and behaviour of the senile rats: the animals remained inert in their movements and indifferent to their surroundings, and their fur and skin were dirty. In fact, the condition of the senile rats injected with the large dose of testosterone propionate became even worse: they were thinner than the controls and their fur was dirtier. Although only a single case of pneumonia occurred among the senile rats injected with large doses of testosterone propionate (Table I), this may be accidental, and therefore cannot be regarded as definitely indicating a favourable effect of the hormone on this disease.

Adult Rats.—After large doses of testosterone propionate the fur of the adult rats became rough and dirty, and a very marked increase in nervous excitability was also noticed, but nothing abnormal was recorded with smaller doses of this hormone or with the other hormones used.

Sex Organs

EFFECT OF SENILITY

It is remarkable that senility did not produce any signs of degeneration, as judged by weight (Table I, Group I) and histologically, in the sex organs of our rats when compared with those of the normal adult rats (Table II, Group I). Spermatogenesis was well developed in both groups. In his excellent book Romeis records the same in the sex organs of his senile rats, which were well fed and cared for and had no apparent diseases, though the comparatively small weight of his rats and, in some, decreased weight of the testes (Romeis, 1931c) show that the diet was probably still deficient in some respects. The pronounced degenerative changes in the sex organs described by some authors Romeis quite rightly explains by unsuitable diet and complicating diseases. After a critical review of the literature dealing with senile changes in the sex organs of human beings he comes to the conclusion that in the healthy senile man the testes might show no significant changes (Romeis, 1931d) from the normal.

EFFECT OF INJECTIONS ON THE TESTES

All the hormones used caused a decrease in the weight of the testes (Tables I and II); even in the six senile rats injected for only twenty-four days, in which rats they were 2.49 grammes as compared with 3 grammes in the controls. The more pronounced decrease in Groups III and VI (Table II) is explained by the fact that treatment was begun at an earlier age. This also explains why in some rats of Group III (Table II) injected with androsterone there was a complete absence of spermatogenesis, the structure of the testes being that of infantile rats. In all other groups the only histological change observed was a slight decrease in the size of the testicular tubules. Spermatogenesis was present, although in some cases it appeared to be slightly less pronounced than in the control rats.

Similar changes in *short-duration* experiments were obtained after injection of pure male hormones by McEuen, Selye, and Collip (1937), Korenchevsky, Dennison, and Hall (1937), Moore and Price (1937, 1938), Sainton, Simonnet, and Petrescu (1938), and Bottomley and Folley (1938). It is remarkable that the prolongation of the injections up to four months in our experiments with large doses did not produce greater pathological changes. This indicates the absence of a true toxic effect of male hormones on the testes of adult animals.

Since the depressing effect of male hormones on the secretion of gonadotropic hormone by the hypophysis is well established (Moore and Price, 1937; Hertz and Meyer, 1937; Hamilton and Wolfe, 1938; Cutuly and Cutuly, 1938), the changes obtained in the testes may most probably be explained by this decreased activity of the hypophysis. Lately, however, evidence has been obtained that the male hormones, when injected into hypophysectomized rats, produce a better development of generative tissue of testes and stimulation of spermatogenesis instead of a depressing effect (Cutuly, McCullagh, and Cutuly, 1938; Hamilton and Leonard, 1938). Even without hypophysectomy, stimulation of the testes by male hormones can be produced in certain animals—for example, ground squirrels (Wells and Moore, 1936).

EFFECT ON SECONDARY SEX ORGANS

The character of the changes in seminal vesicles, prostate, penis, and preputial glands was similar in each group, being most pronounced in the seminal vesicles. An unexpected and striking result was the fact that the effect of androsterone and dehydroandrosterone (depression of sex organs) was entirely different from that of testosterone propionate (strong stimulation) and even from that of testosterone (apparent absence of activity). This depressing effect of androsterone was present even in senile rats injected for only twenty-four days. The mechanism of these important differences in the activity of the sex hormones on non-castrated rats is explained by the simultaneous influence of two opposite factors:

(1) More or less complete suppression of the natural secretion of sex hormones from the testes, owing to the depression of the hypophysis by the injections and the consequent decreased secretion of gonadotropic hormones. This would lead to atrophy of the secondary sex organs.

(2) This atrophying effect is, however, counterbalanced by direct stimulation of the secondary sex organs by the injected hormones, which, some completely, some less completely, replace the natural testicular secretion. Theoretically one would expect that androsterone and dehydroandrosterone, being the weakest hormones, would be least able to replace this natural secretion; testosterone should give

better results, and testosterone propionate alone (even in castrated rats) could produce over-stimulation of the secondary organs. The actual results obtained (Tables I and II) well corroborate this theory.

The changes in weight and size of the seminal vesicles, coagulating glands, prostate, and preputial glands are explained histologically chiefly by changed amount of secretion in the tubules and ducts of these organs. In only a few rats (those in which the organs were most affected) were there definite changes (correlating with the changes in size of the glands) in the number of the tubules or in the size of the secreting cells.

Effect on Non-sexual Organs

THE HYPOPHYSIS

The hypophyses of all the rats, with the exception of two senile animals, were of normal weight (10 to 14 mg.) and size. The two exceptional rats developed tumour-like hyperplasia of the hypophysis, similar macroscopically to that regularly produced by oestrogens. In one animal, injected with 7.5 mg. of dehydroandrosterone a week, the hypophysis weighed 320 mg., and in the other, injected with 0.75 mg. of testosterone propionate a week, the weight was 144 mg.

We have been able to find only two references to the occurrence in rats of spontaneously developed hypophyseal tumours. Fischer (1926) described tumours (largest 8 by 6 by 6 mm.) in two old female rats and in one male, while Romeis (1931b) mentions merely an enlargement of the hypophysis (the largest weighing only about 45 mg.) in four old rats.

The histological picture in Romeis's rats was adenoma-like growth starting from the anterior lobe, while Fischer's two histologically investigated cases had carcinoma-like tumours with "castration" cells (signet-ring cells with colloid-containing vacuoles) starting from the anterior lobe and in addition, in one case, containing adenoma of the posterior part of the hypophysis. In both of these rats there was also adenoma or adenocarcinoma of the thyroid glands. As malignant features of the tumours Fischer mentions irregular growth (with ingrowth into normal tissue), abundant irregular mitoses, occurrence of gigantic nuclei, and nodule-like formations of tumours sharply differing from the neighbouring normal hypophyseal tissue.

In the light of these observations we cannot therefore exclude the possibility of spontaneously developed tumours in our cases. In support of this is the fact that our tumours had a similar histological structure to those of Fischer.

They consisted of cells varying in size from small to gigantic, containing small or gigantic, sometimes lobulated nuclei, with varying amounts of chromatin. The gigantic cells often contained two or three, seldom more, nuclei. Several mitoses could be seen. The nucleoli were often large. The protoplasm of most of the cells was vacuolated in varying degree, producing in extreme cases "foamy" cells. Some of the nuclei were also vacuolated. As frozen sections were not made, the nature of this vacuolation could not be ascertained, but it was obvious that the vacuoles were of two kinds: (1) similar to the usual colloid vacuolation, present, for instance, in the "castration" hypophysis; and (2) empty vacuoles of dropsical or lipoid nature (lipoid having been extracted by fat solvents during embedding). The whole gland was very hyperaemic.

The tumours could be classified as adenomata. Since no invasion into the surrounding tissue and no metastases could be found, the malignant character of the tumours could not be ascertained. The following features suggest, however, that they may be of cancerous nature: (1) variations in the size and form of the cells and their nuclei; (2) variation in the chromatin content of the nuclei; (3) abundance of mitoses; and (4) presence of giant multinucleated cells. It may be mentioned that in chromophobe adenomata of the hypophyses of human subjects mitotic figures are rare (D. S. Russell, personal communication). There are, however, two points which might suggest that injections of the hormones may at least predispose to, if they do not cause, development of the tumours: (1) in our stock of rats we have never come across spontaneously produced hypophyseal tumours in adult or old rats, although we have dissected more than 6,000 rats, of which at least 100 were senile; and (2) the hyperplasias occurred only in the injected animals, although it must be admitted that the number of animals in each group was small.

Taking all the above into consideration, and admitting the possibility that the tumours may have been of spontaneous origin, one definite conclusion can be drawn—that *male hormones in the doses used do not prevent the development or cause the regression of hypophyseal tumours.* The histological structure of our tumours is entirely different from that of the hypophyseal tumours produced by oestrogens (which are hyperplasias of the chromophobe cells of the anterior lobe). It cannot therefore be probable that in our cases the tumours developed as a result of transformation of male hormones into oestrogens, which transformation is quite possible according to the observations of Steinach and Kun (1937).

ADRENALS

In our previous experiments with *castrated* rats (Hall and Korenchevsky, 1938b) all the male hormones investigated caused a decrease in the average weight of the adrenals. In the present experiments with *normal* animals this effect was not produced except in the case of adult non-senile rats injected with androsterone (Table II, col. III). This is in agreement with our previous experiment of twenty-one days' duration with normal animals injected with testosterone and testosterone propionate (Korenchevsky, Dennison, and Hall, 1937). Histological investigation showed that the lipoid content and vacuolation of the cortical cells were decreased, though usually in a much less degree than in our previous experiments on castrated rats, and mostly in the zona reticularis. Testosterone propionate in large doses was the only hormone which caused considerable lipoid depletion. The presence of the gonads therefore in most cases prevents the changes in weight of the adrenals and partly prevents the microscopical changes produced by the injected male hormones.

In the adrenal cortex of three senile rats there was occasional dilatation of blood vessels or their sinuses, forming large lacunae. The surrounding cortex cells were enlarged and degenerated. Since, however, one of these rats was an uninjected control and two were injected (one with dehydroandrosterone and the other with testosterone propionate), these dilatations may be considered to have been caused by senility and not by the injections of the hormones. It might be emphasized, however, that the lacunae were very much larger in the two injected rats than in the control, and that these two injected animals were those which developed hypophyseal tumours.

THYMUS AND LIVER

Thymus.—All the hormones hastened the involution of the thymus in the adult rats (Table II) and in the senile rats, both those injected for a long period (Table I) and those injected for twenty-four days.

Liver.—A decrease, insignificant in two groups and definite in the others (Tables I and II), in actual weight of the liver was recorded, even in those senile rats injected for only twenty-four days (14.73 grammes, as compared with 17.14 grammes in the controls). This is in contrast to the hypertrophying effect of male hormones on the livers of castrated rats (Hall and Korenchevsky, 1938a). When, however, the weights are calculated per unit of body weight there is found to be no significant decrease, the changes in liver weight corresponding more or less to the changes in body weight. No histological changes were found in a preliminary investigation.

KIDNEYS

The weights of the kidneys were not changed, except after large doses of testosterone propionate, when the actual weight was increased about 12 per cent. and the weight per unit of body weight 33 to 36 per cent. No pathological changes were observed histologically, but in the kidneys of some of the injected rats, especially after large doses of testosterone propionate, the convoluted tubules were slightly larger or the cells forming them slightly hypertrophied. The changes in weight and histological structure indicate a slightly stimulating effect of the hormones on the kidneys.

Thyroids, Spleen, and Heart.—No changes were observed.

Fat Deposition and Gain in Body Weight

Since the senile rats ceased to grow, and most of them suffered from pneumonia (though in a slight form; see Table I, last line), our conclusions are based chiefly on the data obtained from adult rats (Table II). Androsterone and small doses of testosterone and testosterone propionate (Table II, cols. III, IV, and VI) did not cause any significant changes, while large doses of testosterone, and especially testosterone propionate (cols. V and VII), had a definite depressing effect on gain in body weight. A decreased fat deposition was found after injections of testosterone propionate, especially in large doses. A similar effect on body weight and fat deposition in normal adult rats of large doses of testosterone propionate (but not of testosterone) has been recorded by Korenchevsky, Dennison, and Hall (1937) in experiments of three weeks' duration. In experiments, also of shorter duration, Sainton, Simonnet, and Petrescu (1938) obtained a similar depressing effect of testosterone propionate on body weight, while McEuen, Selye, and Collip (1937) could not produce any definite changes by testosterone injections (2 mg. for 36 to 38 days). The above results suggest that testosterone propionate, and possibly testosterone, influence metabolism.

Toxicity of the Hormones

All the above-mentioned changes produced by the prolonged injections, even of large doses of the hormones, were of comparatively mild nature and (provided that the tumours in the hypophyses of senile rats have not been caused or stimulated by the injections) could not be classified as toxic. The depressing effect of the male hormones on the development of the testes and especially on the secretion of the anterior lobe of the hypophysis should, however, be taken into consideration by clinicians when treating patients.

Summary

CHANGES COMMON TO NORMAL ADULT AND SENILE RATS

The changes observed after injections of androsterone, transdehydroandrosterone, testosterone, and testosterone propionate in the weight and histological structure of the organs were in almost all cases similar in normal adult and senile rats.

All the hormones depressed in varying degree the development of the testes.

Development of the secondary sex organs was unexpectedly depressed by androsterone and transdehydroandrosterone but not significantly changed by testosterone, and was considerably stimulated by testosterone propionate. An explanation of these differing effects is given.

The size and weight of the hypophyses were not changed except in two injected senile rats, which developed tumours of this gland, different in structure from those produced by oestrogens. Two possible explanations of their origin are given.

Other changes observed in the injected animals were: increased involution of the thymus; decrease in the actual weight of the liver, without histological changes; possible stimulation of the kidneys; some lipoid depletion in the cortex of the adrenals; nervous excitability and decreased fat deposition (with testosterone propionate), and (with large doses of testosterone and testosterone propionate) decreased gain in body weight.

SENILE CHANGES

No improvement in the senile appearance and behaviour of the old rats was produced by the hormones in the doses used.

Taking into consideration the fact that our senile rats had normal sex organs, and that these organs and sexual function might be preserved in otherwise senile men, the absence of a rejuvenating effect of the sex hormones is not surprising.

This does not, however, upset the hypothesis that, *in combination with other co-operative factors*, the sex hormones are important and possibly irreplaceable in the prevention of pathological senility.

The stimulation of the secondary sex organs of senile rats by testosterone propionate cannot be regarded as a rejuvenating effect, since, without simultaneous improvement of the general condition and of the other features of senility, this artificial sex stimulation is biologically unnatural and in patients is medically undesirable.

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THE SULPHANILAMIDE TREATMENT OF GUINEA-PIGS INFECTED WITH BRUCELLA ABORTUS

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During the past few months numerous reports have appeared in this country and the United States of America of cases of undulant fever apparently successfully treated with prontosil or sulphanilamide. In other but less numerous reports no benefit is recorded. In the laboratory Chinn (1938) found that sulphanilamide had a bactericidal effect *in vitro* on *Brucella abortus*, while Britton (1938) failed to observe any such effect. Montgomerie (1938) inoculated guinea-pigs with *Br. abortus*, and about four weeks later began treatment with sulphanilamide. He gave 100 to 200 mg. daily over a period of twelve days and killed the animals ten days later. In three out of four of his treated animals the tissues were culturally sterile. Chinn (1938), who gave 100 mg. daily for a month, starting treatment two hours after inoculation and killing his animals at the conclusion of the course, was even more successful, since he was unable to demonstrate the presence of infection in any of his treated group of six animals. The experiments recorded in this paper were begun before these laboratory reports were published, though Mr. Montgomerie kindly showed us an advance copy of his paper.

Experiment 1

On March 4, 1938, ten male and ten female guinea-pigs, weighing 300 to 400 grammes, were inoculated intramuscularly into the left thigh with 800,000 living organisms washed off from a two-day liver-agar culture of a virulent CO_2-sensitive strain of *Br. abortus* (Astor). Six animals were kept as controls. The others were treated as follows:

Group A.—Starting on March 7, four animals received 100 mg. of sulphanilamide daily by the mouth for five days; two were killed a week after and two a fortnight after the conclusion of treatment.

Group B.—Starting on March 14, four animals received 100 mg. daily for ten days; two were killed a day after and two a week after the conclusion of treatment.

Group C.—Starting on March 21, four animals received 150 mg. daily in two divided doses for ten days; two were killed a day after and two a week after the conclusion of treatment.

The sulphanilamide was given by mouth suspended in gum tragacanth. None of the animals received treatment on Sundays. One or two control animals were killed at the same time as each subgroup of two infected animals. Since these subgroups overlapped, the result was that there were always three, and sometimes four, control animals for comparison with each infected group.

In making the bacteriological examination the animal was anaesthetized with ether, the thorax opened, and blood taken for agglutination from the inferior vena cava. The great vessels were then cut and the animal was allowed to bleed to death. The spleen and sublumbar glands were excised, ground up separately in Griffith tubes and suspended in N/4 Ringer solution; viable bacterial counts were then made on the suspensions by the roll-tube method. In addition the macroscopic appearance of the glands, spleen, and liver was carefully noted, particular attention being paid to the degree of enlargement of the organ as a whole and to the number and size of any focal lesions that might be present. The results were recorded in a series of index numbers varying from 0 to 4. The summarized results are recorded in Table I. (The figures in both tables represent arithmetic mean values, with the exception of agglutinin titres, for which the geometric mean has been used. The figures in the columns headed "Macroscopic" refer to index numbers, with a maximum of 4.)

On the whole the treated animals showed fewer macroscopic lesions, had lower agglutinin titres, and were less heavily infected than the control animals. But the results were disappointing. In only two of the treated animals were the sublumbar glands sterile, and in not one of the treated animals was the spleen sterile. Judging from the number of colonies developing from the sublumbar glands and spleen the animals in Group C did better than those in Group B, and those in Group B better than those in Group A; but the same held true, though to a less extent, of the control animals, showing that the disease was beginning to undergo natural retrogression. It is clear that under the conditions of this experiment the effect of sulphanilamide fell far short of complete sterilization of the tissues.

TABLE I.—*Experiment 1: Comparison of Treated and Control Guinea-pigs*

Group	Treated							Control						
	No. of Animals	Macroscopic			Colonies		Agglut. Titre	No. of Animals	Macroscopic			Colonies		Agglut. Titre
		Subl.	Spl.	Liver	Subl.	Spl.			Subl.	Spl.	Liver	Subl.	Spl.	
A (100 mg. for 5 days) ..	4	0.5	0.5	0.5	12,000	32,000	0	3	1.0	0.3	2.7	16,000	37,000	1/50
B (100 mg. for 10 days) ..	4	0.8	1.0	0.8	1,600	2,400	1/3	4	1.3	1.0	2.5	6,300	36,000	1/270
C (150 mg. for 10 days) ..	4	0.8	0.5	0.8	50	720	1/10	3	1.3	1.3	2.3	1,000	30,000	1/40

Subl.=Sublumbar glands. Spl.=Spleen.

Experiment 2

On July 29, 1938, twelve male and twelve female guinea-pigs, mostly weighing 400 to 600 grammes, were inoculated intramuscularly into the left thigh with 600,000 living organisms washed off from a two-day liver-agar culture of *Br. abortus* (Astor). Of these animals twelve were kept as controls; the remainder were treated as follows:

Group A.—Starting on September 16—that is, seven weeks after inoculation—four animals received 200 mg. of sulphanilamide daily by the mouth for two weeks; two were killed at the conclusion of treatment and two a fortnight later.

Group B.—Starting on September 16, two animals received 200 mg. a day for four weeks and were killed a fortnight later.

Group C.—Starting on September 16, four animals received 400 mg. a day in two divided doses for three weeks; two were killed a day after the conclusion of treatment and two a fortnight later.

Group D.—Starting on September 16, two animals received 400 mg. a day in two divided doses for five weeks. One animal died with toxic symptoms at the conclusion of treatment and the other was killed a fortnight later.

In this experiment the sulphanilamide was administered in crystalline form, the requisite dose being delivered into the mouth at the back of the tongue by a special glass funnel. In none of the groups was treatment given on Sundays, but in Groups A and B a double dose—that is, 400 mg.—was given on Saturdays. The results are summarized in Table II.

TABLE II.—*Experiment 2: Comparison of Treated and Control Guinea-pigs*

Group	Treated							Control						
	No. of Animals	Macroscopic			Colonies		Agglut. Titre	No. of Animals	Macroscopic			Colonies		Agglut. Titre
		Subl.	Spl.	Liver	Subl.	Spl.			Subl.	Spl.	Liver	Subl.	Spl.	
A (200 mg. for 2 weeks)	4	1.3	1.3	1.3	8	1,400	1/1,500	4	2.0	2.8	2.3	1,200	25,000	1/10,000
B (200 mg. for 4 weeks)	2	1.0	1.0	1.0	0	180	1/2,200	2	1.0	1.5	2.0	0	680	1/58,000
C (400 mg. for 3 weeks)	4	0.8	1.0	0	0	0	1/280	4	1.5	2.0	1.0	8	9,200	1/9,400
D (400 mg. for 5 weeks)	2	0.5	0.5	0	0	0	1/900*	2	1.5	2.0	0.5	0	7,200	1/4,200

Subl. = Sublumbar glands. Spl. = Spleen. * One animal only.

As in the first experiment the macroscopic lesions in the treated animals were fewer and less severe than in the controls, the number of colonies growing from the tissues was smaller, and the agglutinin titres were considerably lower. It will be observed, however, that in Groups A and B, treated with 200 mg. a day, splenic cultures were still positive. In Groups C and D, treated with 400 mg. a day, no growth was obtained from either the sublumbar glands or the spleen; in five out of the six corresponding control animals the sublumbar glands were sterile, but in all six animals large numbers of colonies grew from the spleen. One of the treated animals in Group C had no definite macroscopic lesions and showed no agglutinins in the blood, while the animal in Group D that died at the conclusion of treatment likewise showed no macroscopic lesions; its agglutinin titre was not determined. In these two animals virtual cure had apparently been effected.

Discussion

These results need little discussion. They are less favourable than those recorded by previous workers. One reason for this may lie in the technique of cultivation, which in our experiments was probably more delicate than in those of Montgomerie or Chinn. Since infection of guinea-pigs with *Br. abortus* tends to undergo natural retrogression, it was anticipated that the effect of sulphanilamide might depend on the length of time elapsing between infection and the beginning of treatment. For this reason in Experiment 1 treatment was started three to seventeen days and in Experiment 2 seven weeks after infection. Unfortunately the number of animals was too small and the dosage too varied to justify any definite conclusions on this point, but it may be noted that in Experiment 2, when all the animals started treatment at the same time, the results appeared to depend on the size and length of dosage.

Again, it was thought that the effect of sulphanilamide might not be permanent. For this reason in both experiments half the animals were killed soon after the conclusion of treatment and half a week or two later. A study of the behaviour of the individual animals—a record of which in tabular form space does not permit—showed that in Groups A and B of Experiment 1, receiving 100 mg. only for five and ten days respectively, the number of colonies growing from the spleen was considerably higher in the animals left for a fortnight than in those killed soon after the conclusion of treatment. In Group C of Experiment 1 this did not hold true, nor was it apparent in Experiment 2. The results suggest that with small doses the effect of sulphanilamide tends to wear off in the course of a week or two, while with larger doses it is maintained for a longer time.

Summary and Conclusions

Two experiments are recorded in which guinea-pigs infected with *Br. abortus* received sulphanilamide treatment and were compared with untreated control animals.

Though the extent and severity of the lesions in the internal organs, the number of colonies growing from the sublumbar glands and spleen, and the serum agglutinin titre were favourably affected by as little as 100 mg. given daily for ten days, complete sterility of the tissues was achieved only in those animals that received 400 mg. daily for five weeks.

On the basis of these limited experiments it is tentatively concluded that sulphanilamide treatment favours the destruction of *Br. abortus* in infected guinea-pigs, but that for the attainment of a bacteriological cure the drug must be given daily for some weeks in a dose bordering on the toxic limit.

It is conceivable that in the treatment of undulant fever in man a system of dosage less drastic than that necessary to bring about complete bacterial sterilization of the tissues might prove sufficient to control the clinical features of the disease, and in view of the undoubtedly favourable effect in guinea-pigs it is desirable to obtain further information on the treatment of human patients with sulphanilamide. The fact, however, that undulant fever is usually a self-limited disease with a very low case mortality renders it doubtful whether it is justifiable to expose the ordinary patient to the dangers accompanying intensive treatment with this drug. For the present it would probably be wiser to reserve sulphanilamide for severe and chronic cases that have proved refractory to other forms of treatment.

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CLINICAL OBSERVATIONS WITH STILBOESTROL (DIETHYL-STILBOESTROL)*

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The chemical constitution of the oestrus-producing hormone obtained from the urine in pregnancy was first determined in the year 1930–31, when it was shown to possess a *cyclo*-penteno-phenanthrene nucleus. Thereafter attempts were made to discover a synthetic analogue with an identical action. It was found that a large number of compounds containing a phenanthrene ring system possessed oestrogenic properties. Later it was shown (Dodds and Lawson, 1936) that the phenanthrene-ring system was not necessary for oestrogenic activity. Early in 1938 the synthesis of 4:4-dihydroxy-α:β-diethyl stilbene (diethyl-stilboestrol) was reported by Dodds, Golberg, Lawson, and Robinson. This synthetic compound is a white crystalline substance, easily soluble in alcohol, and has a melting-point of 171° C. By the vaginal-smear assay it was found to be two and a half times as active as oestrone and to be highly effective by mouth (Dodds, Lawson, and Noble, 1938). It has further been shown that oral administration can cause interruption of pregnancy in the experimental animal (Parkes, Dodds, and Noble, 1938). Guldberg (1938) has shown that its administration to a castrate with an intact uterus will produce bleeding. The present communication records preliminary results of therapeutic trials of this synthetic oestrogen.

Material and Administration

Fifty-one cases, of which thirty-one were treated in London and twenty in Edinburgh, are included in our joint series. Twenty-nine of these patients had post-menopausal disturbances, and one with an intact uterus had had both ovaries removed; twelve patients had amenorrhoea and three dysmenorrhoea. The synthetic hormone was also tried in six patients in whom it was considered desirable to inhibit lactation. In thirty-eight of the cases stilboestrol was given only by mouth; in two only by intramuscular injection; and in the remainder by both routes. The dosage has varied considerably, as will be seen from the clinical data and case histories below.

Post-menopausal Disorders

The naturally occurring oestrogens are usually singularly effective in controlling post-menopausal disorders. If the disturbance is a severe one it should be rapidly brought under control by giving a relatively high initial dosage of an oestrogenic preparation. In this way the general hormonal balance may be rapidly re-established, and a gradual diminution in the dosage of the oestrogen permits the endocrine system to readjust itself to the depleted ovarian stimulus.

It was accordingly decided to try the effect of stilboestrol on patients with these disorders. In twenty-four of the cases the symptomatic effects of the treatment, in relieving hot flushes, irritability, lassitude, sleeplessness, etc., were controlled by weekly observations of the vaginal epithelium, by the Papanicolau-smear method. Six of the patients had local conditions of the vagina or vulva which were possibly associated with cessation of ovarian activity, and these also provided an objective measure of the results of the therapy.

General Symptomatic Effects of the Treatment

One patient, aged 38, had severe hot flushes, with irritability, following on artificial menopause induced with radium for metropathia haemorrhagica in June, 1938; between August 28 and September 18 she received a total of 31 mg. of stilboestrol by mouth, with marked beneficial effect; uterine bleeding occurred for three days during the treatment. The effects of the treatment in seventeen other patients complaining of hot flushes were also excellent. Fourteen reported complete relief after taking stilboestrol by mouth; the other three were very much improved, though they still had occasional flushes. One of these, who had received many weeks' drug treatment previously, said that "the tablets had worked miracles." All seventeen reported that they felt fitter in themselves and were more easily able to do their work, and several of them were most insistent on how much better they had been sleeping. Three patients with vague menopausal symptoms likewise said that they felt more active and could do their work without getting so tired.

Twenty of the patients mentioned above received stilboestrol in quantities varying from 1 to 3 mg. daily by mouth, and one received a higher dosage. It was found that though the number of flushes was reduced with 1 mg. daily it usually required at least 2 mg. daily to abolish them completely.

Effects on Local Conditions of Vagina or Vulva

Three patients who were suffering from a mild degree of kraurosis vulvae were given 3 mg. of stilboestrol daily by mouth and described their local and general condition as considerably improved. In the following three cases direct objective evidence was obtained as to the apparent value of the therapy:

CASE I

Mrs. T., aged 54. Senile Vaginitis.—In October, 1937, this patient was treated for senile vaginitis with oestradiol benzoate. After a total of 70 mg. in divided doses the condition was completely relieved and the patient was symptom-free. There was a recurrence, however, in October, 1938. She was given 21 mg. stilboestrol by mouth daily from October 30 to November 2—a total dosage of 84 mg. The patient felt slightly nauseated as a result of this treatment, but was not actually sick. She reported on November 6 that she was feeling very well, and on examination the vulva and vagina were normal in appearance.

CASE II

Mrs. N., aged 43. Leucoplakic Vulvitis.—The menopause occurred when 41 years old. Between February and May, 1937, this patient was given 300 mg. of oestradiol benzoate intramuscularly in divided doses. There was a marked improvement in the local condition. She failed to report again until October, 1938, when the condition had relapsed. She was given 5 mg. of stilboestrol intramuscularly every second day from October 9 to 22—a total of 40 mg. Uterine bleeding was induced from October 31 to November 3. She was seen again on November 6, when a definite improvement in the local condition was noted. Thereafter she was given 21 mg. of stilboestrol daily by mouth. This therapy was well tolerated.

CASE III

Mrs. S., aged 59. Leucoplakic Vulvitis.—The menopause occurred at the age of 46. In March, 1937, the patient developed a profuse white discharge and complained of intense pruritus vulvae. This had been so severe as to interfere with sleep. Examination disclosed a marked leucoplakic vulvitis. She was given stilboestrol, 5 mg. intramuscularly thrice daily, from October 21 to November 1, 1938,

* A report to the Therapeutic Trials Committee of the Medical Research Council.

inclusive—a total of 180 mg. After six injections she began to feel well and the itching was relieved; the discharge stopped, and she was very much better in general health. The treatment was well tolerated except for slight nausea occasionally. The local condition was greatly improved and all ulcerated areas were healed. She was thereafter given 6 mg. stilboestrol daily by mouth with good effect.

Two other patients were suffering from pruritus vulvae. The first was a woman, aged 55, on whom a subtotal hysterectomy had been performed fourteen years before, the ovaries being conserved. For the last ten years she had suffered from pruritus ani et vulvae. A fistula in ano had been operated upon, but the pruritus was unaffected. She was treated with stilboestrol, taking 21 mg. weekly by mouth and 10 mg. by injection. After eight weeks on this treatment she thought she was better but still not cured. The second case was also rather hopeless from the start. She was a woman of 59 with diabetes, which had been under control for four years. She had severe pruritus vulvae, which, in spite of the fact that there was no sugar in the urine, refused to respond to any of the treatments she had received. She was given 21 mg. of stilboestrol weekly by mouth and 20 mg. by injections, and though she said she was better than she had been for years the appearance of the vulva was unaltered.

Changes in the Vaginal Smears

Seventeen of the twenty-four smears of vaginal epithelium taken before treatment were unmistakably post-menopausal. When smears were taken after a week's treatment with stilboestrol each one showed a change to the flat keratinized cells of a woman of active sexual life, with complete disappearance of the small round deep cells characteristic of the post-menopausal state. This change was maintained, with one exception, so long as treatment was continued. This one exception was the diabetic patient with pruritus vulvae described above. Though her smears changed after one week's treatment they had returned to the menopausal type when they were examined two weeks later. This is difficult to understand, since there is no doubt that she had received the stilboestrol, as it was given by injection in the clinic. Two of the menopausal patients whose smears had been changed as a result of treatment failed to come up for further supplies for three and four months respectively. At the end of this interval the smears and subjective symptoms of the menopause had returned in each case, but treatment was again effective.

The smears of seven patients were not absolutely typical of the menopause, and it was more difficult to observe with certainty the effects of the treatment, but even in these cases some change could usually be seen. After the treatment the nuclei of the epithelial cells became smaller and more deeply stained as compared with the original smear.

Absence of Ovaries with an Intact Uterus

The one patient in this category was an unmarried woman, aged 38, in whom a bilateral oophorectomy for ovarian cysts had been done in June, 1938. When she was seen four months later there had been no vaginal loss since the operation. Previously her periods, which had lasted four days, were regular. She was suffering from frequent hot flushes, three or more every hour, and two or three at night, which disturbed her sleep. Five mg. of stilboestrol was given by injection twice a week for five doses and 3 mg. daily by mouth, making a total of 79 mg. Four days after the last dose she had a vaginal bleeding lasting two days. The course of treatment was repeated and the patient seen again. Another bleeding lasting two days had occurred. She also reported that she was having no flushes and was sleeping better. After this the dose was maintained at 3 mg. of stilboestrol daily by mouth. The flushes remained under control, but there was no more bleeding.

Amenorrhoea

Eleven cases of secondary amenorrhoea and one case of primary amenorrhoea were treated with stilboestrol. Ten patients had uterine bleeding after stilboestrol therapy; six of these were treated orally and four by intramuscular injection. Two patients failed to respond to treatment; one of these was a case of secondary amenorrhoea, the other of primary amenorrhoea. The following records exemplify the cases treated:

CASE IV

Miss D., aged 22.—Menarche at 15½. Periods started in October, 1931, and continued 3/21 until June, 1932. The patient had no further period until October, 1932, after which periods again continued regularly until May, 1933. Periods subsequently occurred during the winter months only, until April, 1937, since when she had had no further period. There was a tendency towards increase of weight, and she weighed 9 st. 7 lb. when first seen. No menstrual molimen was present. She had had Raynaud's disease for many years. The basal metabolic rate was −21 per cent.; blood-sugar tolerance normal; sella turcica normal; utero-cervical canal, two inches. The patient was given 2 grains of thyroid extract daily for one month.

May 10, 1938.—Weight now 9 st. 3 lb. No improvement in vascular condition; no period.

June 3.—Very slight bleeding following a course of oestradiol benzoate—total amount given, 25 mg.

September 8.—Bleeding for two days starting on July 21, 1938, following two courses of oestradiol benzoate; last injection July 11. Total amount given in two courses, 45 mg.

October 31.—Slight bleeding on September 25, 1938, lasting one hour. Bleeding again on October 20, 1938, which lasted for one hour, after 60 mg. of stilboestrol orally (2 mg. thrice daily).

November 22.—Given 5 mg. of stilboestrol thrice daily by mouth from November 3 to 12 inclusive. Bleeding from November 19 to 21.

CASE V

Miss G., aged 34.—Menarche at 14. Menstruation 4/28 until October, 1936. Patient had three periods between October, 1936, and April, 1937. She was first seen in April, 1938, when she complained of flushes. Blood-sugar tolerance: fasting sugar, 88 mg. per 100 c.cm.; at half-hourly intervals after 50 grammes of glucose, 159, 222, 251 mg. per 100 c.cm. Utero-cervical canal, two inches. Between August 28 and September 7 the patient was given 1 mg. stilboestrol twice daily by mouth, the total amount being 20 mg. Uterine bleeding occurred from September 11 to 14. She was given further 20 mg. of stilboestrol—1 mg. twice daily. On November 13 the utero-cervical canal measured two and a quarter inches. Uterine bleeding had again occurred from October 1 to 5.

December 11, 1938.—The patient has had 1 mg. stilboestrol thrice daily between November 13 and December 10. She has had no further bleeding, but the utero-cervical canal now measures two and a half inches. The patient complained of sickness on one occasion after taking the tablets.

CASE VI

Mrs. M., aged 22.—The patient has never menstruated. Sella turcica normal. Blood-sugar tolerance: fasting sugar, 106 mg. per 100 c.cm.; at half-hourly intervals after 50 grammes of glucose, 159, 177, 168, 150, 130 mg. per 100 c.cm. Utero-cervical canal, one inch. Between July 31 and September 25, 1938, the patient was given a total of 50 mg. stilboestrol intramuscularly. On October 16 she was put on 1 mg. stilboestrol thrice daily for one month. Measurement of the utero-cervical canal on November 28, 1938, showed it still to be one inch. The injections and tablets of stilboestrol were badly tolerated in that they caused sickness.

CASE VII

Miss R., aged 19.—Menarche at 17, in November, 1936. Periods in May, July, and August, 1937. No further period until April, 1938, when only a few spots of blood were seen. On August 7, 1938, the utero-cervical canal was found to be two inches. Patient was given 5 mg. of stilboestrol intramuscularly at three-day intervals for five injections. The last injection was on August 21, 1938. Uterine bleeding started on September 1 and continued for three days. Another course of stilboestrol was given between September 4 and 18 (total amount administered, 25 mg. intramuscularly), and bleeding occurred on October 25, but lasted only one day. A third course of 25 mg. caused another bleeding on December 3, lasting six days. The utero-cervical canal was measured on December 11, and was found to be still two inches. The injections were all well tolerated.

Dysmenorrhoea

The aetiological factors in dysmenorrhoea are so numerous that it is not likely that all patients will respond to any one line of therapy. After the exclusion of constitutional, mechanical, pathological, and psychological factors there is still a residuum of cases in which the pain appears to be related to an imbalance of the two ovarian hormones acting directly on the uterus. It is possible that the menstrual dysmenorrhoea is associated with excessive progesterone activity or a defective oestrogenic function. On this assumption the use of oestrogenic hormones for dysmenorrhoea has been restricted to patients complaining of pain coincident with or during the menstrual flow. Only three cases in this series were treated with stilboestrol.

CASE VIII

Miss P., aged 19.—Menarche at 17. Menstruation 3/28, regular. Last menstrual period, July 31, 1938. Since the menarche she has complained of severe incapacitating pain on the first day of the period. No abnormality was found on pelvic examination. Stilboestrol, 5 mg., was given intramuscularly on August 23, 25, and 27. She had a period from September 2 to 5, with very slight pain. Stilboestrol was again given every alternate day, on three occasions, from October 11. The therapy was well tolerated, no sickness or other ill effect being experienced. No treatment was given before the period from November 17 to 20. There was a return of menstrual pain, but this was not so severe as formerly.

CASE IX

Miss L., aged 18.—Menarche at 14. Menstruation 3–4/28. Last menstrual period, September 8, 1938. The patient complained of severe lower abdominal pain coincident with the onset of the menstrual flow recurring each month since the menarche. She was given stilboestrol, 10 mg. daily by mouth, for four days from October 2. The patient experienced no pain with the period and suffered no ill effects from the treatment.

CASE X

Mrs. E., aged 28.—Menarche at 14. Menstruation 1/28. Patient complained of severe lower abdominal pain with each period. She was given 25 mg. of stilboestrol in divided doses during the second half of the menstrual cycle. There was, however, no improvement in the duration of the ensuing period or any alleviation of the pain.

Inhibition of Lactation

An attempt was made in six cases to inhibit lactation by giving 5 mg. of stilboestrol daily by mouth. No bandaging of the breasts, restriction of fluids, or purgation was used. Treatment was begun in one group of three patients before milk had appeared in the breasts, and in the other three after lactation had begun. In the first group stilboestrol was entirely successful in inhibiting lactation. In the second, although the amount of milk was diminished, the patients felt uncomfortable and other methods of stopping the flow had to be used. It is interesting to note that while the stilboestrol was being administered the breasts were soft and comfortable. In two cases in which it was continued in the same dose for ten days and then suddenly stopped the breasts became engorged. The substance probably acts in these cases on the anterior lobe of the pituitary body by preventing the liberation of the lactogenic hormone.

Undesirable Effects

Six patients complained of slight nausea after taking the tablets by mouth, and a few others treated by the oral route admitted to this symptom on being questioned. The nausea varied in its time and onset, and usually passed off after a few days, although the treatment was continued. One patient experienced slight nausea occasionally after intramuscular injections of stilboestrol; another seemed to tolerate the treatment badly, and was actually sick after both tablets and injections. In none of the others were the side-effects sufficiently severe for them to wish to cease taking stilboestrol on that account. It is of interest, moreover, that one of the post-menopausal patients was able to take as much as 21 mg. of stilboestrol by mouth daily without experiencing any ill effects.

Discussion

The above results indicate that the synthetic substance stilboestrol is as effective as the naturally occurring oestrogens in the treatment of pathological conditions in human patients. It has the further great advantage of being very active when given by the mouth. The only untoward effects noted were slight nausea in some patients, and in two cases actual sickness, but in only one case was the treatment really poorly tolerated. It is of interest that some patients in the amenorrhoea group who were given stilboestrol bled from a hypoplastic uterus. This finding suggests that the effect produced by the therapy in such cases may initially be closely associated with a local vascular change; that the treatment can, however, promote full uterine growth is demonstrated by the case of Miss G. in the amenorrhoea series. Measurements of the urinary excretion of gonadotropic hormone in this case suggested that stilboestrol simulates oestradiol in its effect on the anterior lobe of the pituitary.

Evidence is adduced that stilboestrol given by mouth is able to inhibit lactation. This effect may also be produced by an action on the anterior lobe of the pituitary.

Summary

Forty-five patients complaining of symptoms referable to an endocrine disturbance, and six others in whom it was considered desirable to inhibit lactation, were treated with the synthetic compound "stilboestrol" (diethylstilboestrol). The responses obtained were similar to those which would have been expected from treatment with a natural oestrogen. Oral administration of the synthetic substance, moreover, was found to be as effective as intramuscular therapy. Some of the patients experienced slight nausea during the treatment, but in only one was the treatment poorly tolerated.

One of us (T. N. M.) wishes to express thanks to Dr. Douglas Miller for the privilege of treating cases under his care. The stilboestrol used in this investigation was supplied by the British Drug Houses Ltd. and Boots Pure Drug Co., Ltd., through the Therapeutic Trials Committee of the Medical Research Council.

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THERAPEUTIC TRIALS OF DIETHYL-STILBOESTROL

BY

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The product diethyl-stilboestrol, synthesized by Dodds, Golberg, Lawson, and Robinson (1938), possesses oestrogenic properties which have been described by Dodds, Lawson, and Noble, and later by Folley and Watson. Investigations on human subjects were undertaken by Guldberg. In the light of the evidence so obtained it appeared well worth while to try this preparation in gynaecological practice.

Tests for Harmlessness

I first tried the preparation on myself. On the first day I took one tablet of 0.1 mg., on the second day one of 1 mg.; on the third day I gave myself an intramuscular injection of 1 mg., and on the fourth day an injection of 1 mg. in oily solution. There were no unpleasant symptoms or any pain following the injections. Trials were then carried out on three women with regular menstruation and normal genitalia. Two of them were given injections totalling 5 and 12 mg. diethyl-stilboestrol, respectively, immediately after menstruation: 1 mg. of the substance was given daily by intramuscular injection. The period started in one case five days and in the other six days before it was due. In the third woman the injections were begun on the eleventh day following menstruation, 2 mg. being injected daily for seven days. Here again the period started one week too early. After the period these injections were continued, and a total amount of 33.2 mg. was given. The next menstruation began one week late. The following symptoms were observed in connexion with the treatment in this case. As soon as the individual dose was increased to 3 mg., nausea occurred several hours after the injection. During treatment the breasts became sensitive, the nipples and some small warts on the patient's arm and back became more deeply pigmented, and the clitoris swelled, though only very slightly; libido was increased, and also the general feeling of well-being. When the injections were stopped all these effects disappeared within a week.

Trials for Efficacy

Patients with minor degrees of ovarian insufficiency, such as every gynaecologist sees daily during consultations, were treated. More serious cases of ovarian disturbances were not used for these trials, as it is very difficult to judge a new preparation which only has a substitution effect in complicated endocrine cases.

(*a*) *Four Cases with Climacteric Disorders.*—The main complaints of these patients were frequent attacks, day and night, of flushing and palpitations and excessive sweating. One of them still had occasional menstruations. They received one 1-mg. tablet daily. The symptoms diminished as early as the fourth or fifth day of treatment, and they gradually disappeared altogether. If the treatment was interrupted the attacks returned. One of these patients, who still had occasional periods, suffered from severe nausea about eight to ten hours after taking the tablets.

(*b*) *Four Cases of Dysmenorrhoea.*—Three of the patients were young girls, and one, 24 years old, was married. They all suffered from severe premenstrual pains. Treatment was instituted either by mouth or by injection fourteen to eighteen days before the period was expected. Three patients received between 20 and 30 mg. diethyl-stilboestrol. These three found their severely marked premenstrual pains definitely reduced and made tolerable, while the fourth was entirely free from pain, and was surprised when her period started one week before the expected time. Two patients stated that they experienced nausea some hours after taking the tablets.

(*c*) *A Case of Hypo-oligomenorrhoea and a Case of Secondary Amenorrhoea.*—The patient suffering from hypo-oligomenorrhoea received a total amount of 28 mg. The period following this appeared after thirty days, and lasted for three days instead of barely one day as usual. The patient suffering from secondary amenorrhoea merits more detailed mention. For years she had had irregular periods, often menstruating only two or three times a year. The last period occurred six months ago. The uterus is very small, rigid, and infantile, and the adnexa are not palpable. A stroke curetting revealed poorly developed glandular structure with marked degenerative change of the lining epithelium. The sound length of the uterus was two inches. A course of 11 mg. of diethyl-stilboestrol was given by intramuscular injections, 1 mg. being injected seven times and 2 mg. twice. On the tenth day after treatment was begun another one-stroke curettage was performed. Histologically a more normal structure of the glandular elements was now noted: there was absence of the marked degeneration observed previously.* The patient always experienced severe nausea several hours after the injections and on one occasion had unquenchable thirst (after 2 mg.). Then treatment with 1-mg. tablets was continued until a total dosage of 22 mg. was reached, and proluton was also given, without menstrual bleeding being brought about. The uterus grew half an inch. The vulva and vaginal tissues were looser than before, and more cyanotic. Drawing pains were felt in the abdomen at the time when menstruation should have taken place. This failure is in contrast to the results obtained by Guldberg, where vaginal bleeding was achieved in the case of a castrated woman patient by means of 20.25 mg. followed by synthetic progesterone.

(*d*) *A Case of Ovarian Insufficiency following Supravaginal Amputation of the Uterus.*—A 30-year-old patient, who in 1937 had been operated on by me for supravaginal amputation owing to numerous large uterine fibromas incarcerated in the pelvis, started to have distressing flushings and sweatings one year after the operation, when both ovaries, which showed cystic changes to some extent, had been left. Prompt relief of these attacks was obtained, first of all with injections, then with tablets of diethyl-stilboestrol; the latter, however, invariably caused severe nausea and sometimes vomiting in this case. Even after only 5 mg. diethyl-stilboestrol had been given, relief of the flushings was noticed.

(*e*) *A Case of Pruritus Vulvae.*—The prompt cure of a woman aged 24 was achieved by means of diethyl-stilboestrol tablets—one 1-mg. tablet daily for ten days, without any other treatment. The pruritus reappeared on cessation of the treatment, but a successful result quickly followed when treatment was renewed.

The synthetic preparation ethinyl oestradiol produced gastro-intestinal symptoms which were too severe to enable therapeutic trials to be carried out with that substance.

Conclusions

Diethyl-stilboestrol shows such marked oestrogenic effects that it has a good substitution action in various forms of ovarian insufficiency. In six of the fifteen cases for which it was used unpleasant secondary effects such as nausea or vomiting were produced.

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* For the histological observations in this case I am indebted to Dr. W. A. Oliver of St. Bartholomew's Hospital.

VITAMIN D IN DIET: PALATABLE METHODS OF SUPPLY

BY

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AND

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It will generally be agreed among dietitians that the vitamin most likely to be deficient in the diet of both rich and poor is vitamin D. Of course, there is evidence that the hospital class of patients show signs of lack of vitamin C and that elementary school children in Cambridge and London and miners in Scotland (and even Cambridge undergraduates) take a diet deficient in vitamin A. But the very widespread prevalence of hypotrophic and carious teeth, and of undoubted though mild rickets, points to the fact that vitamin D has been absent from, deficient in, or deficiently absorbed from the diet of most of us. Nor is this surprising, in view of the fact that relatively few common foodstuffs contain vitamin D and that some of those which do are reputedly unpleasant or are costly. It is not so with the other vitamins. Many quite cheap foods—for example, cabbage—have quite high vitamin A and C potencies, and are by no means devoid of vitamins B_1 and B_2, whereas to obtain vitamin D in any quantity recourse has to be had to egg yolk (expensive) or to fish-liver oils, which are to many people—adults usually—offensive to the taste.

To the generalization that "natural" sources of vitamin D are expensive there are two exceptions: herrings and tinned salmon. As the oil of herrings is credited with 10,000 international units per 100 grammes (Boas-Fixsen and Roscoe, 1937–8) and herrings contain from 6 to 10 per cent. of oil, the herring contains 600 to 1,000 units per 100 grammes (about three and a half ounces). As three and a half ounces is a moderate helping, anyone who has eaten herrings may be considered to have had sufficient vitamin D for that day. Tinned salmon ranges from 200 to 800 units per 100 grammes (Boas-Fixsen and Roscoe, 1937–8) and so again one helping will easily yield a day's ration. A day's ration as herrings costs about 1½d. and as tinned salmon about 4d. If we have recourse to egg yolk the figure will be about 10d. No process of cooking or canning does any harm to vitamin D, so that cooked or canned fat fish can safely be used as a source. Apart from these sources we have little that gives us vitamin D in our diet. English summer butter and New Zealand butter have a maximum yield of 25 to 50 units per day's consumption (put at the high figure of two ounces per day). So if we wish to increase the daily dosage of vitamin D we are forced to use fish-liver oils such as those of the cod and the halibut. Of these cod-liver oil is much the most generally used.

Now these oils have the reputation of being difficult to take, and to most adults and many children are nauseating. This in adults is not surprising, for they were brought up to look upon cod-liver oil as a medicine and not as a food. They were given huge doses of a tablespoonful or more three times a day. The properly brought up modern child, however, has a conditioned reflex for fish-liver oils—looks, indeed, on fish-liver oils not only as a food but a pleasant food. They may actually be induced to eat an unusual and new dish by using a fish-liver oil as a condiment.

Unfortunately this is not true of most people. There are a large number of people—children and adults—who either cannot or will not consume such oils. The problem is how to get them to take their daily dose. Many prefer a possible and problematic visit to the dentist to the daily consumption of a nauseous medicine. Others, more convinced, take it as capsules at considerably increased expense; others still, in mixtures with malt, orange juice, and the like, or possibly as the artificial vitamin. One way has not been tried—that is, camouflaged in the form of a sauce or mayonnaise. Fish-liver oils can replace a portion of the oils or fats which form part of the ingredients of soups, sauces, savouries, etc., in which ordinary white fish or shellfish provide the foundation. Such comestibles have a fishy flavour, but no one, unless told, will suspect that part of the fishy flavour is due to fish-liver oils. It is important that the person recalcitrant to fish-liver oils should not know, otherwise the dish will be rejected. Unbiased persons, even if they dislike pure cod-liver oil, will agree that dishes made with cod liver are perfectly palatable. The following is a sauce to serve with boiled, steamed, or baked fish:

> Put into a small pan one tablespoonful of cod-liver oil, half an ounce of flour, salt, pepper, and a little anchovy essence. Heat slightly. Add to this half a pint of milk (off the boil). Stir till boiling.

One tablespoonful of such a sauce will yield from 40 to 200 units of vitamin D according to the potency of the oil, which, of course, should be known. The usual restaurant serving is about one tablespoonful. Most people would take more.

The following is a recipe for a mayonnaise:

> Put in a basin one yolk of egg, add half a saltspoonful each of salt, pepper, and mustard, and half a teaspoonful of sugar. Mix well. Add slowly, whisking well either with a wooden spoon or small whisk, four ounces of cod-liver oil. When half the oil is added, whisk in one tablespoonful of lemon juice and one tablespoonful of Worcester sauce. Add the remainder of the oil, whisking well. Now add sufficient lemon juice or vinegar to flavour. Lastly, stir in one or two tablespoonfuls of milk to make the mayonnaise the desired consistency.

One tablespoonful of this mayonnaise will contain from 1,700 to 8,500 international units of vitamin D. Although so potent it is merely a pleasantly flavoured fishy mayonnaise which could be taken with any fish salad without its source being in the least suspected. The recipe, as a matter of fact, is too potent in vitamin D, and it would be well to substitute for the four ounces of cod-liver oil four ounces of a mixture of olive oil and cod-liver oil—three parts of olive oil to cod-liver oil—so that the vitamin D potency is reduced to about 425 to 2,125 I.U. per tablespoonful.

The principle of using fish-liver oils as an ingredient in any dish which already has fish in it can be extended to hors d'œuvres, soups, batters, pies, potted fish, and savouries. The following is a recipe for fish soup:

> *Ingredients.*—One cod's head (small), a small piece of carrot, a small piece of turnip, half an onion, a bunch of herbs, one and a half quarts of water, two ounces of cod-liver oil, one and a half ounces of flour, half a pint of milk, and one tablespoonful of chopped parsley.
>
> *Method.*—Remove the eyes from the cod's head, and wash it well. Place in a pan with the water, vegetables, and herbs. Heat. Just before boiling skim well. Simmer

slowly for one hour. Strain the stock off. Meanwhile mix the oil and flour till smooth. Add to the stock and bring to boiling point. Add parsley and serve.

The dosage of such a soup is naturally more vague than that of the former recipes, but half a pint will contain more than 375 I.U., and may contain 1,500 if a potent oil has been used. In fact, for ordinary purposes it would be well to substitute one ounce of an ordinary fat for one ounce of cod-liver oil, and so reduce the potency of the soup by one-half.

A batter to be used in deep-fat frying of fish, or for cod's roes, croquettes, etc., is the following:

Ingredients.—Two ounces of flour, one ounce of breadcrumbs, seasoning, one tablespoonful cod-liver oil, and milk to give coating consistency.

Method.—Mix flour, breadcrumbs, and seasoning in a bowl. Make a well in the centre and add the oil. Add enough milk to produce a coating consistency; beat for a few minutes, and set aside to cool for fifteen minutes.

The above recipes should give the average dietitian or the intelligent cook sufficient ideas of how to incorporate sources of vitamin D into the diet of people who are recalcitrant to fish-liver oils when served neat.

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SYMMETRICAL PERIPHERAL GANGRENE IN CARDIAC FAILURE

BY

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Fishberg (1938) has recently called attention to the occasional development of symmetrical peripheral gangrene in cardiac failure. In view of the rare occurrence of this phenomenon and of the problems raised in an attempt to explain its pathogenesis, the following case would appear worthy of record.

Case Report

A man aged 64 first sought advice for rapidly increasing dyspnoea in September, 1937. He had suffered from a chronic cough for many years, but recently had been expectorating sputum which was pink in colour. With rest in bed he improved considerably, but in February, 1938, the dyspnoea became more severe and he suffered from "attacks" of dyspnoea and "faintness" associated with pain in the chest. He was admitted to hospital on February 28 with severe congestive failure, too ill to give a satisfactory history. He was cyanosed, extremely dyspnoeic, with congestion of the veins of the neck, enlargement of the liver, and oedema of the legs and lumbo-sacral region. The heart was considerably enlarged, the apex beat being in the sixth space in the anterior axillary line. There was an apical systolic murmur and a rather faint and indefinite aortic diastolic murmur. The blood pressure was 175/85. Rhonchi and rales were audible all over both lungs. He did not respond to treatment, and three days after admission petechial haemorrhages were noticed on the face, neck, and hands. At this stage both legs and feet became gangrenous, the whole area below the middle of the leg being cold and plum-coloured. The upper limit of the gangrenous area was sharply defined, though there was no definite line of demarcation. In view of the petechial haemorrhages and the sudden onset of the gangrene a tentative diagnosis of bacterial endocarditis with a saddle embolism of the common iliac arteries was made. The patient died that evening.

POST-MORTEM EXAMINATION

Chest.—There was some clear fluid in both pleural cavities, most marked on the right side, and both lungs were fixed to the pleura at the bases and posteriorly by old adhesions. The right lower lobe showed some bronchiectasis, and there was a diffuse fibrosis extending throughout both lower lobes. In places this resembled chronic fibroid phthisis, but no active tuberculous areas were found. Both lungs showed acute oedema. Histologically there was also a terminal haemorrhagic and purulent bronchopneumonia. The heart was greatly enlarged, weighing 23 oz., the enlargement being mainly due to left ventricular hypertrophy, though both ventricles were dilated. All valves were normal. The coronary arteries showed some atheroma, but this was not severe.

Abdomen.—There was some free fluid in the peritoneal cavity. The alimentary canal revealed patchy congestion, and the contents of the ileum were blood-stained. The spleen was small and hard. The liver showed atrophic cardiac cirrhosis and a very severe degree of "nutmeg" change. It weighed 35 oz. The kidneys were normal in size and had a smooth surface; there was some thickening of the arterioles and some fatty change in the cortex. On section the renal arterioles showed hypertensive hyalinization, but both intimal and medial changes were more marked in the arteries of the spleen. The aorta presented a moderate degree of atheroma, but the iliac, femoral, and popliteal arteries showed no obstruction on either side. The skull was not opened. The *post-mortem diagnosis* was congestive cardiac failure resulting from hypertensive heart disease, pulmonary fibrosis, and bronchiectasis.

Discussion

The occurrence of this symmetrical peripheral gangrene with no occlusion of the arteries supplying the part obviously calls for some explanation. The suggestion put forward by Fishberg is that with severe congestive cardiac failure a selective vasoconstriction occurs (? reflexly) as a result of the extreme diminution in cardiac output, so that a smaller amount of blood is distributed to the limbs and a larger to the brain and the other more important viscera. This view is supported by such cases as the one now recorded and by the observation that in the terminal stages of congestive cardiac failure the antecubital and external jugular venous pressures may be grossly different. Fishberg records an instance where the jugular pressure exceeded 20 cm. of water while the pressure in the antecubital vein was under 1 cm. of water. With improvement, which is rare, he has noted that the antecubital pressure rises to that in the jugular vein.

The murmurs heard during life would appear to have been caused by relative incompetence of the mitral and aortic valves due to the great enlargement and dilatation of the left ventricle.

Summary

A case of congestive cardiac failure, the result of hypertensive heart disease, is described in which symmetrical peripheral gangrene of the lower limbs developed shortly before death.

The mechanism of this is discussed, and it is suggested that this is due to a vasoconstriction which leads to a redistribution of the circulating blood in an attempt to protect the vital organs from the effects of the diminished cardiac output.

We are indebted to Dr. R. H. Parry, medical officer of health for the City of Bristol, for permission to publish this case.

REFERENCE

Fishberg, A. M. (1938). *J. clin. Invest.*, **17**, 510.

Clinical Memoranda

Exomphalos Simulating Placenta Praevia

The case outlined below may be considered to merit brief mention.

A healthy woman, 28 years of age, who had borne two normal children, was sent into the Princess Mary Maternity Hospital in labour a month from term in her third pregnancy as a case of placenta praevia. Findings on abdominal palpation were indefinite, and no foetal heart was heard. Vaginal examination revealed a soft fleshy elongated mass, with a haematoma on its surface, protruding through a two-fingers-dilated cervix. A tentative diagnosis of anencephaly with prolapse of cerebral contents through the cervix was made, a bony ridge, which later proved to be the costal margin, being mistaken for the skull bones.

The child was born spontaneously, after a short time, in an attitude of complete extension—corpore conduplicato—the liver being born first, followed by the intestines, a hand, the trunk, breech, limbs, and head in turn. A large exomphalos with a ruptured sac which had enclosed the liver, spleen, pancreas, stomach, small and large intestine, and heart was found. The descending colon ended in a blind sac near to the pancreas. At the lower part of the exomphalos was the origin of the umbilical cord and a rudimentary penis lying between separated pubes. Marked lordosis and scoliosis, sacral meningocele, imperforate anus, and extreme talipes equinovarus were also present.

The placenta was normal, and the mother made an uneventful recovery.

WILLIAM HUNTER, M.D., M.C.O.G.,
Honorary Assistant Obstetrician.
Newcastle-upon-Tyne. Princess Mary Maternity Hospital.

Traumatic Perforation of Rectum

The following case may be considered sufficiently unusual to be worthy of record.

On September 21, 1938, I was called to see a girl, aged 10, who a few minutes previously had slipped while climbing over spiked iron railings. She had walked home, and there said that she was "bleeding." She did not complain of pain.

On examination I found the omentum protruding for about two and a half inches from the uninjured anus. The patient was admitted to Yeovil District Hospital, and about one and a half hours after the accident an operation was performed by Mr. Norman Flower. First, the portion of omentum outside the anus was ligatured and cut off. The abdomen was then opened by a lower paramedian incision, and the omentum traced down to a perforation in the anterior wall of the rectum. At this point the portion of omentum in the rectum unfortunately slipped back into the peritoneal cavity. This portion was excised and the wound closed after insertion of a drainage tube into the pelvis. While the abdomen was open, bruising was seen around the right common iliac vessels, probably indicating the degree of penetration of a spike of the railings.

After operation she had general abdominal tenderness and temperature up to 100.8° for a week. A free discharge of pus from the abdominal wound continued for three weeks, then gradually ceased. The wound had healed when she was discharged from hospital on November 7.

Two remarkable features of this case are that the anus was entirely uninjured and that the omentum was sufficiently long to protrude for two and a half inches.

Yeovil. J. E. MORLEY, B.M., B.Ch.

Reviews

A BACKGROUND TO SCIENCE

Background to Modern Science. Ten Lectures at Cambridge by the History of Science Committee. 1936. Edited by Joseph Needham and Walter Paget. (Pp. 243. 7s. 6d. net.) Cambridge: University Press. 1938.

The history of science has tended, at least in England, to be little esteemed in educational circles. In the first place, active scientific investigators have usually been too busy and sometimes too little skilled in the art of literary exposition to be competent historians. In the next place, there are branches of science which a great researcher, however gifted as an orator or writer, cannot expound intelligibly to an untrained audience. The second difficulty has diminished with the growth of elementary scientific training. Except, of course, in political and administrative circles (and even here only in the highest ranks) total ignorance of science is becoming rare. The first difficulty remains. Whole-time historians of science obviously cannot have first-hand knowledge of more than a fraction of their subject. It is quite true that whole-time teachers of any great branch of knowledge are in the same case, and it cannot be contended that chairs of scientific history ought not to be endowed. But it is desirable that active researchers should supplement the work of professors of the history of science.

The ten lectures printed in the volume under review are the work of men whose contributions to the making of the history they relate have been important, and in some instances epoch-making. It would not be an exaggeration to say that more than half the names are household words throughout the world. Professor Cornford and Sir William Dampier begin with lucid accounts of ancient and pre-Renaissance scientific thought. Lord Rutherford, Professor W. L. Bragg, and Dr. Aston expound the modern history of physics, Sir Arthur Eddington describes forty years of astronomy, Professor Ryle and Professor Nuttall discuss some aspects of medical biology, and in the last two lectures Professor Punnett and Professor J. B. S. Haldane supplement one the other in descriptions of modern evolution theory and genetics. The first question to be asked is how far the second difficulty mentioned at the beginning of this review has been overcome. Will a reader having no more knowledge of physics and astronomy than the first medical examination ensures follow the expositions of Lord Rutherford, Professor Bragg, Dr. Aston, and Sir Arthur Eddington? The answer, so far as the reviewer is concerned, is certainly "Yes" with respect to the lectures on physics. But rather more doubtfully "Yes" with respect to astronomy (a subject which does not cut a great figure in the pre-medical syllabus). As might be expected the medical reader will have less difficulty with the biological lectures—a fact partly due to his training but still more to the skill of the lecturers. Professor J. B. S. Haldane, in particular, has expounded the difficult subject of modern genetics with a rare lucidity and freedom from technicalities.

It is hard not to believe that the scientific changes of the last forty years (the lecturers tried to concentrate upon progress since 1895) have been profounder than in the preceding forty-five, especially in physics. That conclusion, however, may be tainted by the *omne ignotum* fallacy. The medical lectures, interesting as they are, are not so exciting. But they are, perhaps for that very reason, instructive. Most of us know something of the

history of the physiology of digestion and of modern applications of physiology, but Professor Ryle's emphasis on the co-ordination of research, the need for clinicians, physiologists, and pathologists to feel that they are members one of another, is well placed. The story of malaria has often been told, but the layman or even the medical man can learn from Professor Nuttall's lecture (it is melancholy reflection that two of the lecturers here reported have finished their course) that tropical medicine has many unsolved problems.

The editors remark that "it was for us a moving experience to see the great concourse of students, many having to stand or sit on the floor, which gathered to hear these expositions of progress in the sciences during the past forty years by those who had themselves taken some of the foremost parts in it." The lectures were given at Cambridge. A London resident must think of Cambridge with a sense of not ungenerous envy.

SHORT-WAVE THERAPY

The Medical Applications of the Short Wave Current. By William Bierman, M.D. Including a discussion of its Physical and Technical Aspects by Myron M. Schwarzschild, M.A. (Pp. 379; 25 plates, 9 tables. 22s. 6d.) London: Baillière, Tindall and Cox. 1938.

Les Ondes Électriques Courtes en Biologie. By E. Schliephake. (Pp. 96; 37 figures. 30 fr.) Paris: Gauthier-Villars, Ed. 1938.

The bibliography of short-wave therapy is already extensive and deals with the subject from all points of view, but the latest addition in the form of Dr. Bierman's book has two advantages that are sometimes lacking in other works. It is both practical and well balanced. The early chapters are devoted to the history, physics, and physiology of the subject, and in this section Dr. Swarzschild has collaborated with the author most successfully. The following chapters on technique and clinical applications are well worthy of study by the busy but interested practitioner. Technique of application is carefully described with many illustrations, but the angle at which some of the photographs are taken is apt to emphasize some unimportant feature and partially mask the essential point. Clinical applications are discussed at length, and the results of other workers are ably referred to in close association with their suggested modifications in technique. A wide range of conditions amenable to this form of treatment is given, and with the help of an excellent index it is possible for those who are pressed for time to look up even the more obscure without wading through irrelevant matter. In his determination to give credit where it is due the author occasionally leaves the reader somewhat involved in a plethora of information from which it is difficult to draw any positive conclusion. But the general impression given by this book is that it provides a sound working guide to the employment of short-wave therapy in general practice, and as such it will be welcomed by those interested in the subject. The author has compiled an extensive bibliography of his subject to which further reference may be made for information on specific points.

In dealing with a subject such as short-wave therapy it is important that the biological basis upon which all work in this field must be built up should not be disregarded. The merit of Dr. E. Schliephake's work on short-wave currents in biology lies in the fact that the author, a pioneer worker in the subject, shows how biological research can march side by side with therapeutic applications. Dr. Schliephake first of all states the physical principles involved; this he does simply and clearly. He then goes on to discuss the action of short waves within living tissues regarded from the point of view of histology as well as that of gross tissue morphology; part of this is insufficiently substantiated. He refers briefly to the somewhat harrowing series of experiments on which he bases his work and illustrates his findings chiefly by means of graphs. The final section in which the various parts are correlated and briefly discussed is particularly interesting.

RECENT WORK IN BIOCHEMISTRY

Annual Review of Biochemistry. Vol. VIII. Editor, J. Murray Luck; Associate Editor, Carl R. Noller. (Pp. 571; 5 dollars.) California: Annual Reviews, Inc. 1938. London: H. K. Lewis and Co. (22s. 6d.)

The great majority of the numerous contributors to the *Annual Review of Biochemistry* begin with some reference to the vast amount of recent research in their particular spheres. When that applies to each of many departments it presents some idea of the colossal strides of the subject over its whole range. To those generally interested in the science it would appear increasingly impossible to keep abreast of its advances were it not that the *Annual Review* exists to solve their difficulty. Not only does it, so far as is possible, refer to and pass critical judgment upon all the pertinent literature represented by published papers, but it also calls attention to the larger works available in the form of books and reviews.

The seventh volume, while not quite so large as some of its predecessors, maintains the same form and high standard which has won for the publication its almost unique place in biochemical literature. Of so comprehensive a work it is impossible to do more here than indicate a very few of the most important matters with which it deals. Perhaps the outstanding point which emerges from the present volume is the relatively large number of enzymes, hormones, viruses, and toxins which have now been obtained as crystalline proteins. A special chapter on crystalline enzymes shows their number to be no fewer than ten, while in three cases the inactive precursors have also been crystallized. New work of this type has stimulated interest not only in the special groups mentioned but also in protein chemistry. Further impetus in the same direction has been supplied by the preparation of substrates of known and reproducible composition for the study of enzyme specificity, and by the design of a new gasometric method for the determination of carboxyl groups in α-amino-acids.

Special difficulties have for some years beset attempts to establish the structure and dimensions of polysaccharide molecules, and the value of the chapter on carbohydrates lies in the fact that it does much to clarify the existing position of this type of investigation. Present-day knowledge of carbohydrate metabolism, it is pointed out, is tending to show that carbohydrate oxidation is under the influence of an endocrine balance, in which important factors in addition to insulin are anterior-pituitary and adrenal-cortical activity. Such a view no longer necessitates the interpretation of all cases of diabetes as simply due to insulin deficiency. Hormonal progress is treated mainly on physiological lines, which does not mean, however, that due regard is not paid to the brilliant work of Reichstein and others on the steroid compounds of the adrenal cortex. Electrolyte and carbohydrate metabolism in relation to adrenal dysfunction, and the hormonal analysis of the urine likewise represent subjects upon which much fruitful work has been done during the past year.

Two exceedingly important discoveries are described which concern compounds of phosphorus. One is the isolation of an amino-ethylphosphoric acid ester which is present in especially large amounts in malignant tumours, and the other that cocarboxylase has been proved to be a pyrophosphoric ester of vitamin B_1, and therefore provides a link between several different branches of biochemical study. Selected topics such as those to which attention has been drawn serve to demonstrate that the present volume is as full of interest as any in the whole series.

DeLEE'S OBSTETRICS

The Principles and Practice of Obstetrics. By Joseph B. DeLee, A.M., M.D. Seventh edition, entirely reset. (Pp. 1,211; 1,277 illustrations. 55s. net.) Philadelphia and London: W. B. Saunders Company. 1938.

An entirely reset edition marks the twenty-fifth anniversary of this excellent obstetrical manual. Much obsolete material has been omitted, but revision of existing chapters and addition of new sections have enlarged the book by forty-four pages. The author now teaches that x-ray pelvimetry should be a routine ante-natal investigation and should be repeated in the "prepartal stage." He makes it clear, however, that in cases of disproportion, apparent or actual, the final decision as to whether delivery should occur in the operating theatre or the labour ward does not rest with the radiologist. The obstetrical eye on the finger-tip must work in harmony with the "Roentgen eye" of the most accurate of "precision stereoscopes." Unnecessary Caesarean section, even in cases of difficulty, is strongly condemned as being the choice of the unskilful and a cause of many deaths. The student is taught that trial of labour in the hands of a skilled obstetrician, trained in its dangers and its possibilities, will continue to increase the number of pregnancies successfully and naturally terminated, and by so doing will help to reduce maternal mortality. Willett's forceps, which were introduced in London in 1925 and have been used since with good maternal and foetal results, are now mentioned in the treatment of placenta praevia. It is, however, surprising to read that the Braxton Hicks manœuvre is still the safer method for the practitioner to adopt. The illustrations, of which nearly a quarter are coloured, are so excellent it would be difficult to over-estimate their value for teaching purposes. Frequent references to points of historical interest, and a most comprehensive survey of the literature concerning every branch of the subject, play their part in making the book an outstanding achievement. This anniversary edition is a fitting climax to the author's and publishers' work of twenty-five years. We offer our congratulations.

SURGICAL HANDICRAFT IN THE TROPICS

Surgical Handbook for Hospital Assistants in the Tropics. By W. K. Connell, M.B., Ch.B., F.R.C.S., D.T.M. and H. (Pp. 440; 177 figures. 12s. 6d.) London: John Bale, Medical Publications. 1938.

This is a good book. It is written, the author states, with the object of providing a textbook for the native dispensers and sub-assistant surgeons of his service, so that they may attain a standard degree of proficiency. It is divided into twenty-three parts, each complete in itself with its detailed contents heading (a valuable feature), and has 177 illustrations, borrowed largely from other works, for which due acknowledgments are made. The parts are arranged systematically, and surgery is reviewed therein from the standpoints of pathology, clinical signs, and treatment. Its scope is wide, and ranges from the simple wound to the use of prontosil in gonorrhoea. Some of the measures advocated in treatment may seem to our eyes rather advanced for unqualified assistants, and the African standard must be high. The book contains some novel features, and the use of the author's preparation, zipp, for infected wounds and ulcers is of considerable general interest. A certain number of typographical errors have been overlooked and require correction in future editions. Mr. Connell's book is so concise, practical, and withal scientific, that it should prove of great value not only to those for whom it is written but also to any qualified practitioner who adds it to his bookshelves. It is surprising how much useful information has been compressed into this very readable volume.

VON EISELSBERG

Lebensweg eines Chirurgen. By Anton Freiherr von Eiselsberg. (Pp. 568; illustrated. RM. 10.) Innsbruck-Wien: Tyrolia-Verlag.

Anton Freiherr von Eiselsberg, the well-beloved professor of surgery at Vienna, gives a welcome account of his journey through life, beginning with his forebears, whom he traces by means of a family tree from the sixteenth century on the side of his father and a hundred years later on his mother's side. In this long period he has had time to acquire the many good qualities which in his own person have made him friends in every country where he is so well known. Born in 1860, he believes that he remembers his maternal grandfather, who died when the future professor was only fifteen months old. His childhood, like his whole life, was spent in the happiest relationships with the members of his numerous family, and he was fortunate in being spared anxiety about money or his social position, as both were secured to him from birth. He passed from the Gymnasium to the University at Vienna and then determined to become a surgeon, though he confesses that he had to leave the operating theatre when he attended his first operation. From Vienna he took out postgraduate courses with Kölliker at Würzburg and with Hermann at Zürich. By this time he had attracted the notice of Billroth, who appointed him an assistant in his clinic in 1887. Of Billroth he speaks very highly, saying that although he did not accept the Listerian methods in detail he grasped the principles. From this time onwards von Eiselsberg's career was one of continued progress, and as professor of surgery he went from Utrecht to Königsberg and from there to Vienna. He always kept himself abreast of the time, paying visits to Lister at King's College, to the United States, and to the Nordic capitals. During the European War, as an officer in the Austrian Navy, he was busily engaged on various fronts, and as an interlude was called to Athens to treat the King of Greece for an empyema.

The whole story of a useful and happy life is well told. It is not yet complete, and may the conclusion be long deferred. The book is fully illustrated, and ends with a temperate essay on the difficult subject of euthanasia, which von Eiselsberg concludes is wrong.

Notes on Books

The 1939 edition of *Who's Who* was published before Christmas and contains more than forty thousand brief biographies of living men and women within the familiar scarlet covers. The pages of text are fewer by 210 than in the last issue, but a slight increase in the size of the page allows room for a longer column, without obvious growth in the bulk of the volume. *Who's Who* is an indispensable work of reference in all offices, libraries, and

institutions. Every sphere of public activity is covered, with medicine and the sciences receiving their due share of attention. The publishers, Adam and Charles Black, have maintained the quality of their workmanship and the care with which the individual entries are kept up to date. The price of the new volume in stout buckram binding is 63s.; library edition, with leather back, 68s.

It is not to be expected that many alterations would be met with in a standard medical work that has reached its twenty-seventh issue, yet in the latest edition of *Gray's Anatomy* (London: Longmans, Green and Co., 45s. net) the editor, Professor T. B. JOHNSTON, has found means to increase the scope of the volume considerably. The sections on the joints and the lymphatic system have been practically rewritten, the latter from the viewpoint of lymphatic drainage; and a full account of the movements of joints is included, a phase of manipulative surgery that is seldom seen in anatomical handbooks. Much fresh matter has been inserted in the text generally, and the section on orthopaedics has been brought abreast of modern teaching. Many of the older illustrations have been replaced by more up-to-date ones, and the hundred new figures include twenty-nine radiographic plates, an innovation that will be appreciated by students who wish to become familiar with *x*-ray appearances. A great deal more use is now made of colour in the illustrations, and of a total of 1,336 figures, 624 are so reproduced. In its latest edition *Gray's* will assuredly maintain the prestige of its predecessors.

The third edition of a booklet entitled *Gas: A Synopsis of Defence Against*, by Dr. JOHN FENTON, has just been issued. The first edition was published in April, 1937, and in the present one the notes on first-aid posts, decontamination, and anti-gas clothing have been revised in accordance with official instructions. The booklet costs 1s., and can be obtained from Dale, Reynolds and Co. Ltd., 46, Cannon Street, E.C.4.

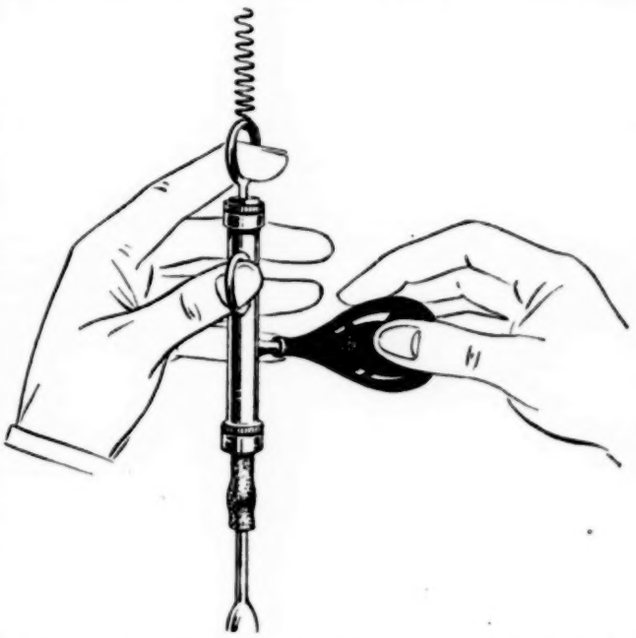
The eighth edition of *Whitla's Dictionary of Treatment* (London: Baillière, Tindall and Cox, 30s.) has been brought up to date by the new editors, Dr. R. S. ALLISON and Mr. C. A. CALVERT, assisted by ten other members of the Belfast Medical School. The eminently lucid and practical character of the work has been retained in this new edition.

Preparations and Appliances

AUTOMATIC PIPETTE PUMP

Dr. DAVID A. HERD (Killingbeck Sanatorium, Leeds) writes:

I have recently invented a useful laboratory device to facilitate the measuring of noxious or dangerous fluids into graduated pipettes or sedimentation tubes. In operation the pipette is attached to the lower end of this pipette pump by a short piece of rubber tubing. The bulb is deflated, the pipette is dipped into the solution, and the bulb is allowed to re-expand. The fluid then rises in the pipette to just beyond the graduated mark. Downward pressure on the uppermost ring (which controls the internal valves) arrests the flow of fluid into or out of the pipette, and at the same time allows the excess of air to escape from the bulb. By gently releasing the uppermost ring the fluid can be lowered to the desired level in the pipette. When it is necessary to wash the pipette out with a fluid before measurement, I have found that this device is of great assistance. Using the old-fashioned method of oral suction preliminary washing-outs of the pipette are both tedious and objectionable. This device therefore enables the biochemist to perform these preliminaries in a much more efficient way and with the minimum loss of time, for instead of having to suck up the fluid and allowing it to flow out by gravity, one can force the fluid out of the pipette by squeezing the bulb. In practice the device can be suspended from the ceiling by means of a very expansile spring, so that at rest the pipette pump hangs in mid-air above the bench sink, clear of all other apparatus. This type of

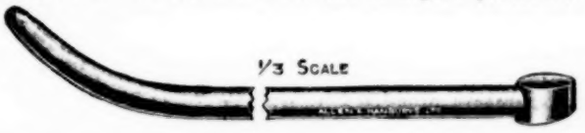


suction device has been in daily use at Killingbeck Sanatorium for the past six months. Similar models are now being manufactured by Messrs. Chas. Hearson and Co., Ltd., Bermondsey, London, S.E.1.

A UTERINE DILATOR

Mr. ALBERT DAVIS, F.R.C.S. (London, W.1), writes:

This instrument has been devised to overcome the difficulties inherent in the standard types of uterine dilators. It is single-ended, so as to avoid the somewhat unsurgical procedure of



handling any part of the instrument that has been inside the uterus; graduated in 1-3 sizes, so as to facilitate dilatation and avoid tearing; and 12 inches long to allow of reasonable distance from the vulva. The lower grades are solid, the upper hollow. The instruments are made by Messrs. Allen and Hanburys, and are available in complete sets from 1-3 to 18-21.

ESTIMATION OF VITAMIN C

Dichloro-indophenol tablets (British Drug Houses, Ltd.) facilitate the estimation of vitamin C in a remarkable manner. Each tablet contains an amount of indicator equivalent to 1 mgm. vitamin C. They can be used for either qualitative or quantitative measurement of the excretion of vitamin C in the urine. The method is simple and can be carried out by the general practitioner. The manufacturers supply a leaflet which explains the technical details of the test.

STABILIZED CALCIUM ACETYLSALICYLATE

The soluble salt calcium acetylsalicylate has many advantages over acetylsalicylic acid, but unfortunately it is an unstable substance which tends to decompose with liberation of free salicylic acid. Coplans and Green (*J. Soc. chem. Ind.*, 1935, **54**, 805) found that the incorporation of a small quantity of calcium chloride inhibited this decomposition. This modification, which is termed "stabilized calcium acetylsalicylate," is now marketed by J. C. Eno, Ltd.

Nova et Vetera

WILLIAM MACMICHAEL, 1784-1839

Despite a distinguished medical career—he was censor and registrar at the Royal College of Physicians of London and physician to William IV and to the Middlesex Hospital—in the centennial year of his death (January 10, 1839) William Macmichael is remembered as a man of letters and not as a clinician or professional leader. That his practice was never very large was due not so much to lack of ability or of bedside manners as to want of ambition. In his youth he had been a keen traveller, journeying through Russia, Turkey, Greece, and Palestine, which experiences he published in 1819, illustrated with drawings of his own. His name lives in medical literature as the author of those two charming and informative books *Lives of British Physicians*, published anonymously in 1830 and reprinted in 1846, and *The Gold-Headed Cane* (1827), which tells the story of its successive owners—Radcliffe, Mead, Askew, William and David Pitcairn, and Baillie. The popularity of the latter is shown by the number of editions through which it passed. Sir William Osler wrote an introduction to the 1915 edition. A genial and amusing companion, who successfully concealed the erudition of his conversation behind a fund of anecdotes, Macmichael suffered a stroke in 1837 at the age of 53, retired from practice, and died two years later at Maida Vale. His scientific writings possess little value.

SIR JAMES CLARK, 1788-1870

Sir James Clark, the sesquicentennial of whose birth fell on December 14, though not a great physician and certainly not a sound diagnostician, deserves to be recalled as a leading figure in English public life and as a pioneer in medical climatology. Born at Cullen in Banffshire, he was educated at Fordyce Grammar School, King's College, Aberdeen, and Edinburgh University. While accompanying a patient with advanced consumption to the South of France and to Italy in 1818, he allowed himself to become intrigued by the part played by climate in the life history of certain diseases, especially tuberculosis, and for many days to come his *Medical Notes on Climate* (1820) and *The Influence of Climate in the Prevention and Cure of Chronic Diseases* (1829) were to be fascinating and indispensable guide-books in unexplored territories. Settling in Rome, he soon acquired a fashionable and opulent practice among the British residents. His most famous patient was John Keats, whose illness he at first failed to diagnose accurately, believing that there was little the matter with the lungs and that mental exertions were the source of his complaint.

Royal Appointments

Moving to London in 1826, he quickly built up for himself a reputation which in 1835 led to his appointment of physician to the Duchess of Kent. Two years later he became physician to Queen Victoria and received a baronetcy. His relations with the Queen were more than professional: he enjoyed her confidence to a remarkable degree, and was often consulted on important matters of State. It was he who advised Balmoral as the Scottish residence. When the Prince Consort was fatally ill with typhoid fever, Clark's diagnosis of "just gastric fever" and his attitude towards his medical colleagues are strikingly portrayed, though with a touch of exaggeration, in Laurence Housman's play *Victoria Regina*. The part which Sir James assumed in the Lady Flora Hastings scandal of 1839 is too melancholy to be dragged to the light again. The exact facts may never be known, and possibly he took upon himself much of the blame which should have fallen on other shoulders. Because he was as indiscreet as the young Queen was heartless both became very unpopular over this affair, particularly when the supposedly pregnant lady-in-waiting died a few months afterwards of malignant disease of the liver (? peritoneum).

An elegant though cautious prescriber, Clark was a polished gentleman who managed to retain his simplicity while inhaling the intricate air of court life. Retiring from practice in 1860, he died at Bagshot Park on June 29, 1870, of a ruptured blood vessel in the stomach. Indifferent to medical societies and hospital appointments with their teaching obligations, Clark was more interested in influencing the profession and the public alike through the medium of his writings. He served on several Royal Commissions, and helped to organize the Medical Faculty of the University of London. His fondness for popularizing medicine sometimes entangled him in difficulties. In 1848, for instance, he applied for an injunction to restrain one Turner from selling certain pills purporting to be made from a prescription of his. The application was refused on the grounds that the offence did not injure his reputation. Amusement and scepticism were caused when a pamphlet published in New York about that time (without date), entitled "The Ladies' Guide to Beauty," was impudently ascribed in the title to Sir James Clark.

W. R. B.

FREDERIK RUYSCH, 1638-1731

The Dutch anatomist and naturalist Frederik Ruysch, the tercentenary of whose birth occurred on March 23, is commemorated by the anatomical eponyms Ruysch's membrane, muscle, tube, and vein. His likeness several portraits have familiarized, the best known being a painting by Johan van Neck in Amsterdam. A pupil of Sylvius, Ruysch took the M.D. at Leyden University in 1664 and a year later was appointed to the chair of anatomy at Amsterdam. In the technique of anatomical injection he introduced so many ingenious innovations that in 1666 he was asked to inject the body of Admiral Sir William Berkeley, who had been killed in battle with the Dutch off North Foreland. Though he was in a bad state of putrefaction, Ruysch succeeded in making him look rosy like an infant. His anatomical museum at Leyden became a showplace which excited the admiration and envy of distinguished visitors. Peter the Great was so enchanted when he saw it for the first time in 1698 that he bought it nineteen years later for 30,000 florins. The collection may still be seen in Leningrad. Ruysch, who was a Fellow of the Royal Society, published many works, of which some are important alike in the history of pathology and of anatomical illustration. He died of a fever on February 22, 1731, at the advanced age of 93.

GUILLOTIN RECALLED

Joseph Ignace Guillotin, the bicentenary of whose birth occurred earlier this year, and who has found an unworthy monument in the bloody emblem of the Reign of Terror, the guillotine, studied medicine at Rheims, where he qualified in 1768, and two years later won his doctor's title at Paris University. In 1784 he served on a commission appointed by Louis XVI to investigate the claims of Franz Anton Mesmer, and in 1791 attempted to reform medical education in his country by attaching medical schools to hospitals, thus visualizing bedside teaching for students. A pioneer in introducing Jenner's discovery in France, he died of anthrax of the left shoulder in 1814. His story, as told by Dr. J. D. Rolleston at a meeting of the Osler Club in London, was related in this *Journal* on November 21, 1931 (p. 956). At a recent sale of the Erskine Hewitt Collection in New York City, from the medical point of view the most interesting item was a profile portrait in oil of Guillotin by Robert Fulton, who is known to-day chiefly as the inventor of the steamboat, but in his time was highly esteemed as an artist.

It has been decided to open a medical historical museum in Berlin after the model of the Wellcome Museum in London.

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NUTRITION OF THE SCHOOL CHILD

It is significant of the trend of medical opinion that pride of place is now given in the Annual Report of the Chief Medical Officer of the Board of Education[1] to problems of nutrition. The first chapter of *The Health of the School Child* for 1937 is devoted to the estimation of the nutrition of representative groups of children, and the second chapter deals with the provision of milk and meals. In general it may be said that except in the "special areas" there was little change in 1937. The methods of assessment have now been more or less standardized during the past three years, and during this period the percentages placed in the four categories—"excellent," "normal," "slightly subnormal," and "bad"—have remained almost identical. On the other hand, in the special areas there are black spots, for Newcastle, Gateshead, Whitehaven, Glamorganshire, and Pontypridd all show considerable increases in the "slightly subnormal" category. A surprising exception to the general rule was Birmingham, where an apparent increase in serious malnutrition occurred during 1937. Detailed analysis of the returns for that city suggests that the standard adopted by two of the assistant medical officers differed widely from that generally employed by other observers and was also divergent from that expected by the Board of Education.

This raises the whole question of how nutrition is being assessed, for there is a widespread opinion among the thinking members of the public that the matter has tended in recent years to become more dependent upon political views than upon scientific methods. The present report faces squarely this criticism, for after quoting the conclusions of a statistician to the effect that "the method of assessing nutrition at present followed by school medical officers, on the direction of the Board of Education, is unreliable" it is remarked that "from the purely statistical aspect these conclusions are no doubt justified." But while the comparatively newly adopted clinical methods of assessment of nutrition are easy to criticize it is difficult to see what can be substituted. Height, weight, and age records are notoriously unreliable mainly because of the difficulties concerned in the differences in the recording of the ages. It is a striking rejoinder to the criticisms, moreover, that the results of clinical assessment for the country as a whole made during 1937 of 1,686,527 children by 1,300 observers were very nearly identical with those of the previous two years. Turning to the measures taken to maintain the nutritional state of the school child the report stresses that "the Board have consistently endeavoured to implement its [the Advisory Committee on Nutrition's] central recommendation . . . that the consumption of a sufficient quantity of milk is, in most cases, the key to the improved nutrition of the school child." In actual figures there was an increase of 4 per cent. in the proportion of children taking milk in schools during 1937. This does not sound a great improvement, but it is apparently regarded in the report as satisfactory and is attributed to the recent campaign for greater utilization of the public health services. Over 90 per cent. of education departments now provide milk in some form or other, and over 50 per cent. of public elementary school children receive milk, either free or on payment of a halfpenny for a third of a pint, under the milk-in-schools scheme. There have been some difficulties in obtaining milk supplies in rural areas, and to get over this an increased distribution allowance has been arranged. It is satisfactory to note that no relaxation in the standards of safety has been allowed, and the suggestion that small schools in rural areas could more easily get their supply in bulk than in bottles has not been favourably received. The report quotes with satisfaction "the constantly growing evidence that pasteurization has no significant effect upon the nutritive value of milk." But milk is not necessarily the only supplement that is needed to enable the poor and undernourished child to obtain the full benefit of education, and there was a definite increase in the number of free meals provided in 1937. Perhaps equally important was a very striking increase—from 29,500 in 1936 to 44,000 in 1937—in the number of children who obtained meals on payment at school canteens.

A special section of the report deals with hypovitaminosis and quotes the report of the London County Council's chief school medical officer to the effect that vitamin C defects might be remedied by preparations of ascorbic acid on the advice of the school doctor, just as he advises cod-liver oil for vitamin D deficiency. School organizers and their medical advisers might well study in this respect the interesting suggestions made elsewhere in this issue (p. 14) by Miss Jessie Lindsay and Professor V. H. Mottram on more palatable methods of supplying vitamin D, a deficiency

[1] See *British Medical Journal*, December 31, 1938, p. 1383.

in which is probably the most likely of all the vitamin deficiencies. Herrings, tinned salmon, and appetizing sauces made from cod-liver oil might well be added to the menus of school canteens. Incidentally these experts should remove a widespread doubt with their statement that "no process of cooking or canning does any harm to vitamin D." In view of the statement in the Board of Education report that milder forms of rickets are by no means uncommon and actually show an increased incidence in London in recent times, anything which will secure an adequate daily ration of vitamin D is to be welcomed.

LIVELIHOOD AND MORTALITY

The section of the fourteenth Annual Report of the Registrar-General in which Farr discussed the mortality rates of males engaged in different occupations as shown by census and registration data of 1851 was not that great man's first contribution to the subject—he had compared the mortality of noblemen with that of the East India Company's labourers before there was a General Register Office—but may properly be regarded as the first of that invaluable series of official analyses of which the latest (Part IIa of the Decennial Supplement, 1931) is now in our hands. The eighty years which have passed since Farr commented on the favourable mortality of farmers and the unfavourable mortality of innkeepers and butchers have seen many changes. The increase in volume and precision of the analysis would have rejoiced the heart of its originator. But it is not praising famous men of old unduly to say that from the beginning Farr saw the problem as a whole, that he clearly perceived the complexity of his problem. Occupations differ in three respects: (1) specific hazards to life or health, (2) economic and social status, (3) regional distribution. All three must to some extent affect rates of mortality, and it would be wrong to attach overwhelming importance to (1). But since hazards coming under (1) are more amenable to legislative control it was proper in the earlier days to stress these as Farr did in his evidence before the Royal Commission on Conditions of Miners (1865), which contains the earliest statistical study of pulmonary disease in Cornish mines.

Our modern data of tin miners, of sandstone workers, and of slate workers still show great occupational hazard—for instance, tin and copper miners below ground have a comparative mortality figure of more than three times the standard for all causes and more than eight times the standard for respiratory tuberculosis—but here, as in other purely occupational hazards, such as industrial lead poisoning, there has been great improvement during the last half-century. It is true that some new risks—for example, forms of malignant disease associated with working processes or substances not used before—have been discovered. But on balance purely occupational hazards have been greatly reduced, and in this reform statistical investigation has played a leading part. It is therefore right that the emphasis in official statistical investigation should have been shifted somewhat from the occupational to the social-economic aspect. This change was apparent in the 1921 report, which gave especial prominence to the social grading of occupations and the relation of grading to general and specific rates of mortality. In the present report a further step has been taken. For the first time the mortality rates of married women have been compared with those of their husbands. The importance of this is evident. Wives are not subject to the purely occupational risks of their husbands—perhaps only in some branches of the textile industry is there any exception to this rule—but they must share their economic and geographical disabilities. If, then, both husbands and wives are at an advantage, or disadvantage, it must generally follow that non-occupational factors are responsible. No doubt the tendency of like to mate with like plays some part, but selection is out of fashion and most would endorse the official view, which stresses the economic-social environment. *De te fabula narratur*: it is always interesting to consider our own circumstances. In the classical thirty-fifth Annual Report (supplement) Farr pointed out that the clergy had lower rates of mortality than physicians and surgeons, especially at early ages; "the young curate," he said, "compared with the young doctor has less cares." In 1931 the contrast was hardly less than in 1871. The mortality of clergy (Anglican Church) was 69 per cent. of the standard, that of registered medical practitioners 106 per cent. of standard. The difference is largely an occupational difference. The vicar's wife and the doctor's wife are social equals, and economically there is not, on the average, much between them. We should, then, expect the mortality rates of wives to differ little. The analysis shows that the wives of clergy have 85 per cent. and the wives of doctors 79 per cent. of the standard rates.

Enough has been said to indicate the importance of this new departure. We shall now refer very briefly to some results. Taking first males and using comparable figures, the most striking result is the diminution of range of variation from highest to lowest social class. In 1921–3 the highest class were 18 per cent. better and the lowest 24 per cent.

worse than the figure for all groups; the range in 1930–2 is from 87 to 112. This is due to an improvement in the mortality of the lowest social class, which shows in every age group (except 25–35, in which class II shows equal improvement) more diminution of mortality than any other class. The range of mortality of married women is rather greater—from 9 per cent. below to 13 per cent. above standard—but similar. When regions are considered it is found that the range is greatest in county boroughs of the North of England—from 57 to 135 for males and from 92 to 151 for married women (in each case the figures are percentages of national rates without distinction of social class). In rural districts these class distinctions are greatly lowered or even obliterated. The analysis seems to lead to the conclusion that "men living in country districts do not show any effects of social grading upon mortality, although married women show it to a slight degree." Another point noted is that "men of the unskilled class and their wives in rural districts show no northern excess of mortality, whereas in towns their northern excess is greater than for any other class." The assigned causes of death which contribute to the class differences are carefully analysed, and may be summarized as follows. Tuberculosis, syphilis, cancer, valvular disease of the heart, myocardial disease, arteriosclerosis, bronchitis, pneumonia, pleurisy, hernia, insanity (not general paralysis of the insane), and accidental causes are, both for men and wives, more deadly in class V than in classes I and II. Leukaemia, acute endocarditis, angina pectoris, appendicitis, cirrhosis of the liver, and suicide cause significantly more deaths of men and wives in classes I and II than in class V. Diseases of the prostate are more fatal in classes I and II than in class V. Diabetes, cerebral vascular lesions, gallstones, and nephritis are more deadly to males of classes I and II than to those of class V, but in women the relation is reversed or absent.

The compilers of the report remark that the slightly greater range of mortality with social class noticed among wives is due to the fact that wives do not share the "compensating disadvantages of affluence which men suffer, through an enhanced mortality from an important group of diseases." The social grading of mortality assigned to cancer is analysed in detail, and in general the results of 1921–3 are confirmed. New and important are the analyses of cancer of the breast and uterus by social class and civil state. The social gradients of these site rates are opposite, so that the combined mortality rates differ little from class to class.

"It would appear that several factors are concerned in the production of these cancers. Marital condition and parturient history on the one hand must help to determine whether the malignant process affects the breast or uterus, but these factors do not seem to appreciably affect the total mortality from cancer of these two sites, at any rate between the ages of 45 and 65."

We have left ourselves no space to speak of the occupational tabulations, but these are in a form which is, or should be, familiar; and in any event mere epitomizing of such tables must be dull and may be misleading. In our opinion this volume should be studied by all medical men, not merely by public health officials. It requires study, not hasty perusal. There is enough raw material in it to occupy many research workers. These workers should be recruited from the medical profession and need not be statistical specialists. Too often official documents are treated as storehouses from which goods are hastily chosen for a particular purpose. The compilers have indeed taken great pains to prevent misuse—in particular to help readers to avoid the pitfalls of "small numbers"—but they cannot force readers to be impartial in selection, and no doubt many erroneous social conclusions will be "proved" by official figures. The only security against this error is a well-informed professional opinion.

A NEW SYNTHETIC OESTROGEN

The publication in this issue of the *Journal* of two articles, by Drs. W. R. Winterton and T. N. MacGregor and by Dr. Alfred A. Loeser, describing the clinical application of the synthetic oestrogen diethylstilboestrol marks the end of one phase of a brilliant series of researches which began in 1924. One of the first steps in this was made by Allen and Doisy when they employed the smear method for estimating the activity of the female sex hormone. Next came the discovery by Aschheim and Zondek in 1927 that the oestrogenic substance could be obtained in large quantity from the urine of pregnancy. This substance was crystallized in 1929 independently and almost simultaneously by Marrian in England, Butenandt in Germany, and Doisy in America. The way was now open for the organic chemist. It had been suggested by some workers that the oestrus-producing hormone is related to the sterols, and it was soon found to possess the cyclo-penteno-phenanthrene nucleus. Shortly afterwards the constitution of oestriol and oestradiol and other oestrogen substances was worked out. The fact that several substances of slightly differing constitutions were capable of exciting the same biological response led Cook, Dodds, and their co-workers to make a determined study of the specificity of the oestrus reaction. The biological effect of a very large series of phenanthrene compounds was studied, and in 1933 the activity of a relatively simple substance was recorded by Cook, Dodds, and Hewett.[1] It is interesting to note than 100 mg. of this substance had to be injected into an ovariectomized rat in order to produce

[1] *Nature*, 1933, **131**, 56; and Cook and Dodds: Ibid., 1933, **131**, 205.

the same effect as one-thousandth of a milligramme of the naturally occurring substance. Later, Dodds and Lawson[2] showed that the phenanthrene ring system was not essential for oestrogenic activity, and a number of active compounds in relatively simple structures were described. From then on an intensive search was made in order to simplify the molecule and at the same time to increase the potency. This culminated in the present year in the synthesis of diethyl-stilboestrol, a substance three times as potent as that of the natural hormone oestrone.[3] In an article in this *Journal*[4] Parks, Dodds, and Noble showed in experimental animals that the oral administration of diethyl-stilboestrol prevented the implantation of the blastocyst if it was given soon after ovulation and that it could also terminate an established pregnancy. The clinical observations recorded in our present issue show that this substance is active when given by mouth to human beings. Winterton and MacGregor obtained symptomatic relief by giving diethyl-stilboestrol to patients with post-menopausal disturbances and obtained objective evidence of the usefulness of this substance in cases of senile vaginitis and leucoplakic vulvitis. Cases of secondary amenorrhoea were also treated, and it was observed that a hypoplastic uterus can be induced to grow by this treatment. Intensive animal experiments have proved that diethyl-stilboestrol is capable of replacing oestrone in every way, and evidently this substance will find wide clinical application in the future. It is also of great theoretical interest in that it brings the question of cell proliferation one stage nearer chemical control. It is as well to draw attention to the fact that the remarkable results now obtained by administering an artificial oestrogenic substance by mouth were preceded by ten years of patient and elaborate scientific research, and that, although in the beginning the work appeared to be purely of academic interest, it received the support and encouragement of the Medical Research Council from its inception.

CHRONIC MAXILLARY SINUSITIS

Unanimity of opinion on the surgical treatment of any disease usually leads to uniformity of results. There is possibly less unanimity of opinion on the treatment of chronic maxillary sinusitis than on that of any other chronic inflammatory condition. Larroudé of Lisbon[5] has attempted to clarify the classification of the varieties of chronic maxillary sinusitis and to define more clearly the indications for different methods of treatment. To this end he has modified slightly the displacement method devised by A. W. Proetz in 1932. The method, which demands expert radiography, allows the ciliary action of the mucous membrane lining the nasal sinuses to be studied. It consists in introducing a 25 per cent. solution of thorotrast into one middle meatus and then with a suction apparatus aspirating air from the opposite side with both nostrils firmly closed. If the patient phonates at the same time the soft palate shuts off the pharynx, air is withdrawn from the sinuses, and the contrast fluid penetrates the ostium and fills them. The patient lies on his face during the manœuvre with the head in such a position that the antrum to be investigated lies below. Radiographs are taken at intervals of twenty-four hours, and a normal sinus with active cilia should be empty after seventy-two hours. A column of the opaque fluid can be seen mounting towards the ostium and being maintained against gravity by the action of the cilia, probably aided by an agglutinating effect of mucin. The existence of an artificial opening into the antrum does not interfere with this normal flow towards the ostium. According to Larroudé, when radiographs taken in the ordinary way show a thickening of the mucosa and no pus is found after puncture-lavage, the condition is due either to a chronic maxillary sinusitis of a latent type or to an allergic swelling of the mucosal lining, which latter may resolve spontaneously without leaving any trace of thickening. Only the thorotrast displacement method can settle the diagnosis. When the thickening is allergic the cilia are active and the thorotrast is evacuated within the normal period, but in a latent sinusitis the thorotrast may not penetrate the ostium at all, or if some solution does reach the sinus the emptying is delayed for up to six days or more. The latent forms of chronic maxillary sinusitis are particularly difficult to diagnose because the patient has few nasal symptoms and suffers chiefly from focal absorption, causing general tiredness, headaches, arthritis, and so on. The only effective treatment is a Caldwell-Luc operation. All the diseased mucosa must be removed and a flap of mucous membrane cut from the inferior meatus must be laid on the floor of the denuded cavity; from this flap the new mucous membrane regenerates, usually in six months. The operation should never be performed in children under 12 years of age because it would destroy the tooth germs of the second dentition. If intranasal drainage is necessary in children the difficulty of washing out the antrum may be overcome by the use of a self-retaining rubber catheter. Cases of chronic maxillary sinusitis with a serous discharge in which the contrast fluid penetrates easily and is evacuated within six days require only an intranasal opening for drainage; when the contrast fluid does not penetrate, or evacuation is delayed beyond the six-day period, a Caldwell-Luc operation is considered necessary. The radical procedure is also called for in cases of chronic catarrhal maxillary sinusitis characterized by the formation of polypi. In the purulent forms of maxillary sinusitis, when the displacement method shows that the cilia are active, it is again sufficient to make a permanent intranasal opening under the inferior concha and to wash out the suppurating antrum a few times. But when the evacuation of the thorotrast is delayed for six days or more, or where it refuses to penetrate even after the application of adrenaline to the middle meatus, the radical operation must be undertaken. Many laryngologists will not agree with the statement that in a case of suppuration of dental origin the affected antrum must never be washed out through the socket of the extracted tooth. Such cases are often cured by a few irrigations through the socket, and

[2] *Nature*, 1936, **137**, 996.
[3] Dodds, Golberg, Lawson, and Robinson: *Nature*, 1938, **141**, 247.
[4] *British Medical Journal*, 1938, **2**, 557.
[5] *Ann. Oto-laryng.*, 1938, **2**, 113, 222.

the risk of establishing a permanent fistula is not so great as the author suggests. Larroudé's views are quite clear, and, provided the displacement method can be used, there should be no difficulty in classifying cases of chronic maxillary sinusitis and advising the appropriate treatment. It is apparently assumed that the radical operation always brings about a cure, but no evidence of complete restitution of the mucous membrane with normal ciliary action after the operation is given. Unfortunately, other investigators have described maxillary sinuses so treated filled with scar tissue. Admittedly such end-results are rare, but Larroudé himself would probably be the last to claim that the treatment of chronic maxillary sinusitis presents no further problems.

MORE ON RAYNAUD'S DISEASE

It is now nearly eighty years since Raynaud described a group of cases under the title of local asphyxia and symmetrical gangrene of the extremities, and thus drew attention to a condition which has since borne his name. His view that the vascular disturbance characterizing the malady arose from spasm of the arteries of the digits consequent on a disturbance of the vascular nervous system remained untested and unchallenged until 1929, when Sir Thomas Lewis published the first of a series of researches into the mechanism of the condition. In his first paper Lewis[1] showed that in severe cases attacks of cyanosis of the fingers were due to closure of the digital arteries in response to cold acting locally, and that spasm of the digital arteries of the fifth finger was not relieved when their vasomotor innervation was paralysed by anaesthetizing the ulnar nerve with novocain. Subsequently he and Landis[2] demonstrated that attacks of full cyanosis of the digits could still be induced by local cold after cervico-dorsal sympathetic ganglionectomy. On the basis of these experiments Lewis concluded that the essential abnormality in Raynaud's disease is not in the nervous system but is a local fault of the digital arteries whereby they contract to obliteration in response to moderate cold. This view was not at first generally accepted because of the very considerable improvement in the state of the fingers which sympathectomy usually confers. However, as Lewis pointed out in this *Journal*,[3] the beneficial effects of sympathectomy are to be expected on his hypothesis, because in the non-sympathectomized subject exposed to cold the constriction of the digital arteries is due not only to the local response of the vessels but to sympathetic vasoconstriction also; and even if this nervous factor is normal in degree its removal will increase the difficulty of throwing the digital arteries into spasm. Lewis's hypothesis is now accepted by most of those acquainted with the facts of the case; but there are some, and particularly on the other side of the Atlantic, who believe that the first and mildest stage of the disease is one in which the essential disturbance is nervous, and that it is only in the later and more severe cases, in which prolonged spasm has led to anatomical changes in the vessels, that evidence for a local fault can be obtained. The chief argument advanced for this view is that the mildest cases of the malady are completely relieved by the operation of preganglionic sympathectomy, which, as previously mentioned in these columns,[4] is followed by less regain of vascular tone than is postganglionic section. The effects of preganglionic cervico-dorsal sympathectomy in six cases of Raynaud's disease are described by Lewis in a recent article.[5] In three of these cases attacks of full cyanosis of the sympathectomized digits occurred spontaneously or could be induced by local cooling within a few days of operation; in one of these three there were no local nutritional changes in the fingers and the capillary pulsation test showed the vessels to be free from gross structural disease. In only two of the three remaining cases could attacks be induced before operation, and after operation in these two abnormal contraction of the digital arteries in response to cold was demonstrable, although no attack of full cyanosis could be induced. In the remaining case attacks could not be induced before or after operation. Lewis observes that the six patients on whom these studies were carried out constitute a series ranging from the relatively severe to the mild case; sympathectomy merely lowered the whole scale of abnormality without appreciably changing the relative positions of the members of the series. This, he insists, is what is to be expected on the removal of normal sympathetic tone; it is not what would be expected if the malady were due to unnaturally exalted sympathetic tone, for whether this were initially mild or severe its removal should reduce all cases to the same state. The local vascular fault in Raynaud's disease might conceivably be either functional or structural, and in a second paper Lewis[6] has described an extensive investigation into the anatomy of the digital arteries in Raynaud's disease and in control subjects. In an earlier paper he and Pickering[7] had divided so-called "Raynaud's disease" into a number of categories, and had shown that in one of these—bilateral gangrene of digits—the vascular lesion was essentially thrombotic. Lewis now found that in cases presenting intermittent asphyxia without nutritional changes the digital arteries are not dissimilar to those found in control subjects of comparable age. In these, therefore, the local fault is not anatomical, and is presumably functional—namely, an ability to contract with abnormal strength in response to local cooling. In cases showing intermittent asphyxia with local nutritional changes the digital arteries of scarred and unscarred fingers were plugged with organized blood clot. Finding no evidence for the view that the arterial disease in these cases is attributable to pre-existing spasm, he concludes that the primary event is probably thrombotic. These researches have given unusual precision to our knowledge of the mechanism of Raynaud's disease. A yet more difficult task remains: that of determining how these abnormalities of the vessels arise.

[1] *Heart*, 1929-31, **15**, 7.
[2] Ibid., 151.
[3] *British Medical Journal*, 1932, **2**, 136.
[4] *British Medical Journal*, 1937, **1**, 1076.
[5] *Clin. Sci.*, 1937-8, **3**, 321.
[6] Ibid., 287.
[7] Ibid., 1933-4, **1**, 327.

TREATMENT WITH DEPOT INSULINS

Since the introduction of protamine-insulin in Denmark by Hagedorn two or three years ago rapid progress has been made in the study, production, and use of slow-action insulins in every country. In 1936 Scott of Toronto discovered that the addition of traces of zinc (1 mg. per 500 units) greatly delayed the absorption of insulin from the depot injection and hence prolonged its action. Observations on patients have shown clearly that a dose of some 30 to 50 units of zinc-protamine-insulin can continue its action for twenty-four hours, and thus it presents a method of treating diabetics with one instead of two or three daily injections. This is the compound that is manufactured by British firms, and it is very stable, uniform, and satisfactory. The best means of using the compound, its advantages and limitations, have been dealt with by now in some 200 papers. It is a pleasure to record that a supplement of the *Acta Medica Scandinavica* (*Supplement* **90**) has recently been dedicated to Dr. Hagedorn, the discoverer of the protamine-insulin compounds, on his fiftieth birthday. Among other contributions are articles from Dr. George Graham and Dr. R. D. Lawrence on their use of protamine-insulins, the first by two daily injections, the second by one. There is general agreement that zinc-protamine-insulin is the most useful form of the new depot insulins. By its injection once a day the milder cases, needing some 20 to 30 units of insulin daily, can be as satisfactorily controlled as with 10 to 15 units twice a day of the old soluble insulin. Such patients require only an additional small concentration of injected insulin to help to rectify their disordered carbohydrate metabolism. In more severe cases a larger supply of insulin is necessary, and this cannot be absorbed from the depot insulins rapidly enough and in sufficient quantity to control hyperglycaemia and glycosuria. During the night (in the absence of food) zinc-protamine-insulin can deal with the endogenous production of sugar and control the diabetes, but by day insufficient insulin is liberated to deal with the carbohydrate in the food and the urine is loaded with sugar all day. If the dose of zinc-protamine-insulin is raised in an attempt to control the day's glycosuria the result is hypoglycaemia at night or just before breakfast. The failure to recognize the weak, though prolonged, action of depot insulins, particularly zinc-protamine-insulin, explains the failures recorded by some workers and the criticisms levelled against this new preparation. To rectify this it seems necessary in severe cases to add a soluble quickly acting insulin to prevent the heavy glycosuria resulting from meals. Lawrence particularly has advocated this, and in such cases he adds the older insulin to the new in the same syringe before breakfast. In a few very severe cases a second dose of soluble insulin may be necessary before the evening meal, but by such combinations even severe cases can usually be treated by one injection a day. The value of other forms of depot insulin—some old, some new—has been compared and described recently by Ammon,[1] and by Beckmann and Weitzsacker.[2] Insulin has been mixed with either adrenaline or posterior pituitary extract in the hope of delaying its action, but the result is not so good as with zinc-protamine-insulin. They also record their trials of "surfen-insulin," in which insulin is combined with the antiseptic "surfen," a complicated chinolyl-carbamide compound. Their results show a prolongation of action similar to that of zinc-protamine-insulin, but it produces in some patients severe local inflammatory reactions at the site of injection. It appears that at present zinc-protamine-insulin is by far the most satisfactory of depot insulins, and has established itself now for nearly two years—a comparatively long time at the present rate of chemical research on the subject.

[1] *Dtsch. med. Wschr.*, 1938, **64**, 1388.
[2] *Klin. Wschr.*, 1938, **17**, 1321.

NEW YEAR HONOURS

The full list of New Year Honours conferred on members of the medical profession will be found at page 30. Dr. John Donald Pollock, upon whom a baronetcy is conferred for benefactions and services to education, was at one time in private medical practice but since the war has been mainly engaged in the direction of large industrial concerns. In 1937 he established in Scotland a trust for educational and religious purposes as a memorial to his parents. Two well-known London deans receive the honour of knighthood: Professor William Wilson Jameson, of the London School of Hygiene and Tropical Medicine, and Dr. Adolphe Abrahams, of the Westminster Hospital Medical School. The same honour is conferred on Mr. John Ramsay, for fourteen years surgeon-superintendent of the Launceston General Hospital, Tasmania, and past-president of the Tasmanian Branch of the British Medical Association, for services to surgery in the Commonwealth of Australia; on Colonel Alexander James Hutchinson Russell, I.M.S., Public Health Commissioner with the Government of India; and on Colonel Krishnaji Vishnoo Kukday, I.M.S. (ret.), of the Central Provinces and Berar. Mr. Frank James Pearce, consulting dental surgeon to Guy's Hospital, also receives a knighthood, and Miss Ellen Mary Musson, Chairman of the General Nursing Council for England and Wales, becomes D.B.E.

THE HALF-YEARLY INDEXES

The usual half-yearly indexes to the *Journal* and to the *Supplement* have been prepared and will soon be ready. They will, however, not be issued with all copies of the *Journal* but only to those readers who ask for them. Owing to the nature of its contents the *Key to Current Medical Literature* will not be indexed. Any member or subscriber who wishes to have one or both of the indexes can obtain what he wants, post free, by sending a postcard notifying his desire to the Finance Department, British Medical Association House, Tavistock Square, W.C.1. Those wishing to receive the indexes regularly as published should intimate this.

On January 1 the Sheffield Royal Infirmary, established in 1797, and the Sheffield Royal Hospital, established in 1832, lost their separate identities by Act of Parliament and became the Royal Sheffield Infirmary and Hospital.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

ORCHITIS, VARICOCELE, AND TWISTED CORD

BY

ALEX. E. ROCHE, M.Ch., F.R.C.S.

The treatment of acute orchitis consists of anodynes, rest in bed, support and raising of the scrotum, with application of heat to it, and finally incision should suppuration occur, as shown by persistence of pyrexia, redness, and oedema, and by attachment of the tender lump to the skin, which becomes smooth and glazed. On incision a necrotic piece of testicle may escape with the pus, as in the following case.

Three weeks before being seen, a man of 51 had had two shivering attacks, followed by increased frequency of micturition, which was painful. Clinical examination was negative, apart from the fact that the urine was very turbid with tiny flakes. *X*-ray examination being negative, cystoscopy was performed eleven days later. The trabeculated and inflamed bladder held only a few ounces; the ureteric orifices appeared normal. Three and a half weeks later there was an acute left epididymo-orchitis. A fortnight later a little thick pus was aspirated. Eleven days afterwards the testicle, being no smaller, though less hot and tender, was explored. The temperature was 98° F. or less, though it had touched 100° once, two days before operation. There was some superficial pus, but none in the tunica vaginalis. On incising the tunica albuginea an abscess cavity was found containing loose necrotic pieces of testicle, which were removed, and the cavity was drained. The pus contained only *B. coli*. This was a true suppurative orchitis.

Seven months later a right epididymo-orchitis subsided after treatment by fomentations. Three and a half years after this, when the patient died following operation for perforative appendicitis with peritonitis, the notes state that the right testicle and epididymis were rather soft; the left, atrophied and soft.

The treatment of tuberculous epididymo-orchitis includes constitutional measures, tuberculin injections, orchidectomy, and possibly ligature of the opposite vas deferens. Syphilitic orchitis calls for anti-syphilitic treatment or orchidectomy, the latter being especially desirable if the diagnosis from neoplasm is uncertain. It is perhaps not superfluous to state that the preventive treatment of acute epididymo-orchitis calls for avoidance of gonorrhoea, rest in bed when urethritis is actually present, avoidance of testicular trauma, gentleness in urethral instrumentation and irrigation and in prostatic massage, and section and ligature of the vasa deferentia to prevent post-prostatectomy epididymo-orchitis.

Varicocele

When confronted with a case of varicocele it is well, before having recourse to surgery, to remember that varicocele is an affection of adolescence and young adult life, rarely being seen afterwards and tending to spontaneous disappearance; that the symptoms associated with it are usually mental rather than local; and that the testicle is imperilled more by the operation described in textbooks than by the varicocele itself.

The varicocele that is secondary to a renal neoplasm differs from the ordinary variety in its rarity (the only example I have come across was secondary to a huge right renal neoplasm, and was seen in the Fellowship examination); in its different age-distribution, since renal growths occur usually after middle age; in its more rapid development; in not disappearing during recumbency; and in not being practically restricted to the left side. The treatment of such a symptomatic varicocele differs from that of the ordinary idiopathic type in that any treatment adopted must be directed to the causal condition in the kidney. Though usually a late symptom, such a varicocele may occur early, and, according to Thomson-Walker (1936), is not to be considered as contraindicating operation, the varicocele disappearing after nephrectomy.

Since the main symptoms of varicocele are general, and the condition is transient, it is reasonable in most cases to content oneself with reassuring the patient that the condition will not cause impotence, sterility, or testicular atrophy, although the associated testicle is usually small and flabby. One may point out that its poor quality probably compares favourably with the degenerative combination of fibrosis and atrophy which has often been noted to follow the usually described operation. In addition to reassuring the patient, one may recommend a suspensory bandage, open-air exercise, cold baths, and marriage.

The indications for surgical measures are genuine and severe local pain in a mentally stable individual, or Army and Navy regulations in candidates for those services. In fact, so few cases of varicocele seen by me have presented the above indications for operation that I have operated on only two patients.

INJECTION TREATMENT

Injection treatment of varicocele, of which I have no experience, has been recommended for large varicoceles. Points in the technique which have been advocated are that the patient should be standing; that the skin should be cleaned with an uncoloured fluid; that the selected vein should be held firmly; that care should be taken that the point of the needle is really in the vein; that the site of injection should be afterwards pinched; and that the patient should lie down for ten minutes, keeping the scrotum raised. Employing this technique in seven cases, Hanschell (1928) had no haematoma. The veins became hard and tender, and remained so for about a week. In four of the seven cases examined after three months the varicocele appeared cured, the veins could be felt as very thin hard cords, and the testicle seemed unaltered. Only one injection is required. The solution used was quinine urethane (1 c.cm. of a solution of quinine hydrochloride 4 grammes, urethane 2 grammes, distilled water 30 c.cm.). Others have used 5 per cent. sodium morrhuate (Porritt (1931a, 1931b) 2 c.cm.; McEvedy (1932) 2½ to 3½ c.cm.).

When I used to inject varicose veins in the leg the patient was made to lie down and the limb was compressed, if necessary, in order to render the veins prominent. In the standing position which has been recommended for the injection of varicoceles there is a risk of the patient's feeling faint, and the caution necessary to prevent a fall should be redoubled by recalling a recent case in which a standing patient, having varicose veins injected, fell, sustained a fractured skull, and only narrowly survived.

The ordinarily described operation of ligaturing and excising about an inch of the anterior bundles of veins, and approximating the cut ends, must almost invariably risk the involvement of the spermatic artery in the ligatures. In fact, the ligature of this artery is actually included by one authority in his description of the technique of the operation. Such being the case, it is not surprising that the classical operation, even though resulting in symptomatic relief, has in a high proportion of cases been followed by fibrosis and atrophy. Nor is relief invariable. Kenneth Walker (1923) states that persisting pain and tenderness have often necessitated secondary orchidectomy.

THE RECONSTRUCTIVE OPERATION

Dissatisfied with the ordinary operation for varicocele, Turner Warwick (1931) has described a reconstructive operation in which only unvalved veins are excised, "leaving a pampiniform plexus protected by two or three valves. . . . Valves in these channels present themselves as dilatations. The competence of any particular valve is proved by the absence of reflux of blood downward after the segment of vein below has been emptied upwards." I have not practised this operation, but in my own two cases care was especially exercised to ligature veins only. The first patient cannot be traced; the second, aged 29, whose left testicle hung about two inches below the right in a lax pendulous scrotum, was operated upon on March 7, 1938, when, in addition to resection of one anterior and one posterior varicose vein, the lower quarter of the scrotum was excised. When last seen, on September 19, there was still slight fullness of the left pampiniform plexus, but there were no symptoms, and both testicles were on the same level, felt normal, and had testicular sensation.

Twisted Cord

Roughly half the cases of torsion of the spermatic cord occur with fully descended testicles—a fact insufficiently recognized, and one which leads to these cases often being wrongly labelled epididymitis, especially since strangulated hernia is much more easily excluded than in the case of torsion with incomplete descent, where operation makes the diagnosis clear. However, the fact that in about 50 per cent. of all cases of torsion of the spermatic cord the involved testicle is incompletely descended shows that incomplete descent, which is very rare in comparison with full descent, must be a predisposing cause of twisting of the cord.

PROPHYLACTIC TREATMENT

Actually, with both complete and incomplete descent, the testicle, instead of being normally attached posteriorly, is usually suspended upside down and is free within the cavity of the tunica vaginalis, the predisposing influence of incomplete descent on such an abnormally mobile testicle in causing it to rotate being probably due to its greater liability to be affected by muscular action. Therefore, what one may call the prophylactic treatment of torsion of the cord is achieved by treatment of incomplete descent of the testicle, successful treatment of which, whether by orchidopexy, orchidectomy, or other means, must eliminate a certain proportion of torsions.

Another class of torsions which may be eliminated by prophylaxis is that of recurrent mild torsions, where timely orchidopexy between attacks will not only prevent further painful attacks, each of which inflicts some damage on the testicle, but will anticipate the final destructive attack of acute haemorrhagic torsion which is otherwise almost certain. That it may not be quite certain may perhaps justify a waiting policy in the case of intelligent patients who learn to untwist their own torsions, though this is not a course which I would indefinitely recommend.

CLINICAL UNTWISTING

With regard to actual torsions, although spontaneous untwisting almost certainly occurs in mild cases, clinical untwisting by manipulation is the first mode of treatment to be considered. Unfortunately it is applicable to a minority of cases, since it can be performed only with fully, or almost fully, descended testicles, and then only in early cases. The surgeon is unlikely to meet such early cases, with which the general practitioner is called upon to cope. Hence the desirability of the latter's being familiar with the condition, in the diagnosis of which the factors of importance are the sudden and apparently causeless onset of pain, soon followed by swelling of the painful testicle, usually at about the age of puberty, in the absence of urethral or urinary infection. Scrotal oedema and redness and mild pyrexia soon develop, so that epididymitis is simulated.

In a recent interesting article Lambert and Smith (1938) mention that restlessness, as with colic, was a striking and often-noted feature, and that relief following untwisting was equally striking and greater than that obtained from morphine. As the twist, consisting of half to four turns about a longitudinal axis, is usually from without inwards, the rule for untwisting the cord is, while supporting the testicle, to rotate it from within outwards. (In one of Lambert and Smith's cases, in which clinical untwisting was carried out five hours after onset, the amount of rotation necessary to undo the twist was 360 degrees.) If this increases the pain, rotation in the opposite direction should be tried. Here is a useful field for the general practitioner's efforts, since untwisting becomes impossible later on. Three cases seen at hospital by me within a period of five weeks in 1927, and treated by orchidectomy, arrived respectively fifty hours, one week, and five days after the onset of symptoms. If in an early case clinical untwisting fails, operative untwisting should be immediately attempted, as there is a chance of saving the testicle and of fixing it so as to prevent further attacks.

IMPORTANCE OF EARLY RECOGNITION

The earlier these cases are seen, and the more aware general practitioners are of the condition, the greater the number of testicles that may thus be saved in the future. The fact remains, however, that in the few recorded cases of untwisting of the cord, whether clinically or at operation, the usual result has been atrophy or sloughing of the testis. Lambert and Smith (1938) record an interesting case of a doctor's son who, since November, 1932, when he was 14, has had recurrent torsion of the spermatic cord treated repeatedly and successfully by non-operative manipulation, without subsequent atrophy (up to June, 1937). But, although there may be no clinical diminution in the size of this testicle, which may retain testicular sensation, its progressive damage, in the absence of orchidopexy, is strongly suggested by my case of a patient aged 27 who was seen after fifty hours of torsion. He had had about a dozen attacks (treated as epididymitis) since the age of 14. His blue-black and diffusely haemorrhagic scrotal left testicle showed microscopically the effects of the previous twists: spermatogenesis, though fair, was localized, and areas of hyaline change and necrosis supplied further evidence of an old lesion.

TREATMENT IN CASES OF LONG STANDING

When the torsion is already of long standing when first seen, the practical choice lies between expectant treatment (with rest in bed, support, and perhaps cold applications) and orchidectomy. The former is justifiable in a mild or already subsiding attack, especially if the opposite testicle is absent or is incompletely descended. The advantages of expectant treatment are the avoidance of an operation and the preservation of the testicle, even if, as is almost certain with a tight twist of long duration, atrophy be the outcome. Orchidectomy is indicated when pain and swelling persist and when the swelling is very large. It is usually of the size of a hen's egg, but a swelling of the size of a child's head has been recorded. The following case caused some diagnostic doubt because of the patient's age (57) and the presence of fluctuation.

There had been ten days' pain and swelling of the right scrotal testicle, which was found to be tender, swollen, and fluctuating, with the skin reddened but unattached. There had been no urethral discharge but some increased frequency of micturition, and there was a history of gonorrhoea thirty-five years previously; yet the urine was absolutely clear and without shimmer. There was thought to be slight enlargement of the prostate, with a little tenderness above it. Temperature, pulse, and respirations were respectively 98°, 96, and 18. The diagnosis of probable torsion (? abscess) was made. Two days later the cord was found to be twisted, and a deeply congested and blackened testicle was removed.

The advantages of orchidectomy are the immediate disappearance of a painful swelling (facilitating an early return to work) and the radical guarantee against recurrence.

Finally, in all cases of doubt exploration is indicated, especially when the differential diagnosis from strangulated inguinal hernia is not clear, when the testicle is incompletely descended, and when a hernia coexists.

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Dr. A. Neave Kingsbury's annual report for 1937 of the Institute for Medical Research at Kuala Lumpur indicates the variety and extent of the work done in connexion with the preparation of prophylactic biological products; bacteriological, chemical, and entomological investigations; a rat virus inquiry; and serological and medico-legal activities. In the year under review cholera outbreaks among immigrants from India and China were arrested at Port Swettenham and Penang, while in September canine rabies cases had to be dealt with in Singapore following the admission of an infected dog. Filariasis was found to be a serious problem in the vicinity of the River Bernam, and to be endemic in certain areas of Perak and Pahang. Dr. Poynton estimated that about 1 per cent. of the population had elephantiasis, and that about 2 per cent. more were infected. Work on rat viruses showed that the use of a selected strain of *Streptococcus viridis* might be very effective for rat extermination, but, since it is pathogenic for man, its employment was inadvisable when there was any possibility of contamination of food or water supplies. The report contains also a survey of cholera in the Malay States during the last thirty years; spread up-river seems to have been a not uncommon direction of extension of the epidemics.

IMPERIAL CANCER RESEARCH FUND

THIRTY-SIXTH ANNUAL REPORT

The thirty-sixth annual report of the Imperial Cancer Research Fund contains the usual review of the year's work by the director of the Fund, Dr. W. E. Gye. The removal from Queen Square to the new laboratories at Mill Hill took place in July, and necessarily interfered with the programme of research, but essential routine duties, such as the preservation of standard strains of tumours, were continued without interruption. The new buildings at Burtonhole Lane, Mill Hill, include a laboratory block, animal houses, stables, and two cottages for members of the staff. The central office of the Fund is now housed in the Royal College of Surgeons in Lincoln's Inn Fields, and Mr. Kennedy Cassels has taken over the duties of secretary.

Carcinogenesis

According to Dr. Gye, it is now certain that thorotrast, which is a colloidal solution of the radio-active thorium dioxide, in small doses produces sarcomas at the site of injection in a large proportion of rats and mice. Dr. L. Foulds injected small quantities of this substance into the bases of the nipples of female guinea-pigs, and obtained at the exact site of injection one carcinoma and three sarcomas. Two of the tumours were found two and a half and three years, respectively, after injection. This long delay in a short-lived animal suggests that ten or fifteen years might elapse before thorotrast produced a tumour in man. Three of these thorotrast tumours proved to be transplantable, and the carcinoma which was one of them is apparently the first glandular cancer produced by the local action of a carcinogenic agent.

The problem of the interaction of carcinogenic substances and viruses attracts increasing attention. Experiments were carried out at the Fund's laboratories and at the National Institute for Medical Research to determine the effect on rabbits of intramuscular injections of tar and subsequent intravenous injections of Shope fibroma virus. In normal rabbits the virus produces at the point of inoculation fibroma-like lesions which always regress, usually in two to four weeks, and which are not regarded as neoplastic. In tarred rabbits regression was delayed for many weeks, and there was not only a fibroma at the site of the tar injections but also a generalized fibromatosis. One rabbit of a small series in each laboratory developed later a sarcoma at the site of the tar injection, but it has not been possible to reproduce this effect as yet. Further investigation by Dr. Foulds revealed that a single dose of tar injected about a week before the virus caused localization, while a single dose given four months previously did not. Multiple doses were rather more effective than a single dose, but the essential localizing factor was the immediate tissue reaction to tar and not the presence of tissue which, having been long in contact with tar, might be suspected of being in a pre-cancerous state.

Hormone Studies and Tissue Culture

Dr. W. Cramer and Dr. E. S. Horning have continued their investigation of the changes that follow the prolonged administration of oestrone. Such treatment leads to enlargement of the anterior pituitary with almost complete disappearance of the granular acidophil cells, degenerative changes in the adrenals, and the development of mammary cancer. This suggested the existence of a physiological antagonism between oestrone and the hormones produced by the pituitary acidophil cells, and in fact these changes were not seen when preparations containing the thyrotropic hormone of the anterior pituitary were given at the same time as the oestrone. Thyrotropic hormone was

then administered to twenty-five female mice from the age of 2 months—just before reaching sexual maturity—to ages varying from 10 to 16½ months. None of these mice developed breast cancers, though in the strain used the incidence of spontaneous mammary cancer is about 50 per cent.

Dr. R. J. Ludford has investigated the action of a number of chemical compounds on tissue cultures of normal and malignant cells. Heptyl aldehyde, for example, had no demonstrable selective action upon the growth of malignant cells, though it has been claimed that it causes extensive liquefaction and sometimes regression of mammary cancers in mice. When sarcoma cells and normal fibroblasts are grown together on plasma clots the former liquefy the plasma more rapidly than the latter. This liquefaction is increased by germanin (Bayer 205), and to a lesser extent by trypan-red and trypan-blue, apparently by the specific stimulation of a particular property exhibited by most malignant cells and some non-malignant cells. The significance of this process is being further investigated.

Biochemical Effects of Radiation

Dr. Cramer and Mr. H. G. Crabtree have conducted experiments to determine whether certain enzyme systems in the living cell are differentially affected by radiation. The glycolytic process occurring in the cancer cell has been shown to be specifically and almost immediately inhibited by radiation in a dosage which does not damage, for example, respiratory or glyoxalase activity. Normal retinal glycolysis is inhibited even more rapidly than tumour glycolysis, and curves of glycolytic inhibition have been constructed, using a rat's retina as a test object, for different times of irradiation and varying wave-lengths. The correspondence between curves for γ-radiation, β-radiation, and 200 kV x-radiation is so close as to make it clear that a given dose whether of γ, β, or x-radiation produces exactly the same degree of inhibition of retinal glycolysis—that is, the biological effect is constant whatever the quality of the radiation. Quantitative studies of glycolysis suggest too that this inhibitory action is not only a function of the dose but is also to some extent progressive with time, so that if the time of application of a given dose of radiation is prolonged a significantly greater effect is produced.

The Consultative Committee's Report on Secondary Education with Special Reference to Grammar Schools and Technical High Schools has been published for the Board of Education by H.M. Stationery Office at 3s. 6d. It embodies the results of an inquiry on which the Consultative Committee has been engaged for nearly five years, and is the complement to that committee's report on the Education of the Adolescent (1926), generally known as the "Hadow" Report, which discussed the organization and curriculum for public elementary schools for boys and girls above the age of 11 administered under the Elementary Code. Two features in particular of this valuable report on secondary education will cause it to be regarded as a milestone in the progressive development of our national system of education. The first, which affects the administration of that system and constitutes a radical alteration in its structure, is the proposed creation of a new type of school—technical high school—which will provide a course of study of realistic and practical character for boys between the ages of 11 and 16 parallel to the existing academic courses of study in the secondary (grammar) school, and will enjoy in all respects the same status as the grammar school. The second feature is the drastic and far-reaching recommendations for remodelling and readjusting the traditional curriculum of secondary (grammar) schools now administered under the Board's regulations for secondary schools. In Chapter III the committee summarizes the salient ascertained facts about the mental and physical development of children between the ages of 11 and 16.

NEW YEAR HONOURS, 1939

In the list of New Year Honours, issued as a special supplement to the *London Gazette*, the names of the following members of the medical profession are included:

Baronetcy

JOHN DONALD POLLOCK, O.B.E., M.D., C.M., LL.D.Ed., Hon. D.Sc.Oxon. For benefactions and services to education.

Knighthood

ADOLPHE ABRAHAMS, O.B.E., M.D., F.R.C.P. Dean and Lecturer in Medicine, Westminster Hospital Medical School.

WILLIAM WILSON JAMESON, M.D., F.R.C.P. Dean and Professor of Public Health, London School of Hygiene and Tropical Medicine.

KRISHNAJI VISHNOO KUKDAY, C.I.E., L.R.C.P. and S.Ed., L.R.F.P. and S.Glas. Colonel, I.M.S. (retired). Central Provinces and Berar.

JOHN RAMSAY, C.B.E., M.B., Ch.B., F.R.A.C.S. For services to surgery in the Commonwealth of Australia.

ALEXANDER JAMES HUTCHINSON RUSSELL, C.B.E., M.D., B.Ch., D.P.H. Colonel, I.M.S. Honorary Surgeon to the King. Public Health Commissioner with the Government of India.

C.B. (Military)

FRANCIS JOLLIE GOWANS, M.B., B.S. Surgeon Rear-Admiral, R.N. Honorary Surgeon to the King.

FREDERICK DUKE GWYNNE HOWELL, D.S.O., *M.C.*, M.R.C.S., L.R.C.P., D.P.H. Major-General, late Royal Army Medical Corps. Honorary Surgeon to the King. Deputy Director of Medical Services, Aldershot Command.

C.M.G.

ERROLL AUBREY NEFF, M.D. Colonial Medical Service. Director of Medical Services, Cyprus.

FRANK VICTOR GORDON SCHOLES, M.D., B.S., D.P.H. Medical Superintendent of the Infectious Diseases Hospital, Fairfield, State of Victoria.

C.I.E.

GORDON COVELL, M.D., D.P.H., D.T.M. and H. Lieutenant-Colonel, I.M.S. Director, Malaria Survey of India.

JAMES BENNETT HANCE, O.B.E., M.D., B.Chir., F.R.C.S.Ed., M.R.C.S., L.R.C.P. Lieutenant-Colonel, I.M.S. Residency Surgeon in Mysore, Bangalore.

ERNEST WILLIAM O'GORMAN KIRWAN, M.B., B.Ch., F.R.C.S.I. Lieutenant-Colonel, I.M.S. Professor of Ophthalmic Surgery, Medical College, Calcutta, Bengal.

NORMAN METHVEN WILSON, O.B.E., M.R.C.S., L.R.C.P., D.T.M. and H. Major-General, I.M.S. Surgeon General with the Government of Madras.

C.V.O.

CHARLES PAUL WILSON, F.R.C.S. Surgeon, Ear, Nose, and Throat Department, Middlesex Hospital.

C.B.E. (Military)

ARTHUR MORRELL JOHNSON, *M.C.*, T.D., M.D., C.M. Colonel, Territorial Army. Assistant Director of Medical Services, 42nd (East Lancashire) Division, Territorial Army.

WILLIAM ALBERT ROBERTSON, *M.C.*, M.D. Colonel, Territorial Army. Assistant Director of Medical Services, 51st (Highland) Division, Territorial Army.

GEORGE LESTOCK THORNTON, *M.C.*, T.D., M.R.C.P., M.R.C.S. Honorary Colonel, 43rd (Wessex) Divisional Royal Army Medical Corps, Territorial Army. Colonel (retired), late Territorial Army.

C.B.E. (Civil)

ARTHUR STANLEY GRIFFITH, M.D., Ch.B., D.P.H. Bacteriologist, Medical Research Council.

CHARLOTTE LEIGHTON HOULTON, M.D., B.S., F.C.O.G. Chief Medical Officer, Women's Medical Service, India.

JAMES LIVINGSTONE THOMPSON, M.B., C.M. For public and social welfare services in the State of Victoria.

M.V.O. (Fourth Class)

BERTRAM COHEN, M.B., B.S. Honorary Physician, Victoria Cottage Hospital, Sidmouth.

O.B.E. (Civil)

KOMBUR RAMASWAMI KRISHNASWAMI AYYANGAR, M.D., Ch.B., D.P.H. Lieutenant-Colonel, I.M.S. (retired). Lately Director, Pasteur Institute of Southern India, Coonoor.

DAWARKA PRASAD BHARGAVA, M.B., B.S., F.R.C.S. Major, I.M.S. Professor of Surgery, Prince of Wales's Medical College, Patna, Bihar.

ERIC DONALDSON, M.D., D.P.H. Medical Officer, Ministry of Health.

ETHEL ADELAIDE DOUGLAS, M.B., B.S. Missionary Doctor in Charge, Lady Kinnaird Women's Hospital, Lucknow, United Provinces.

WILLIAM MOWLL FRAZER, M.D., D.P.H. Medical Officer of Health, Liverpool. For services in connexion with air raid precautions.

ALICE WOODWARD HORSLEY, M.B., Ch.B. Medical Practitioner, Auckland, New Zealand. For social welfare services.

JOHN SUTTON WEBSTER, M.B., Ch.B. Colonial Medical Service. Radiologist, Medical Department, Straits Settlements.

ALEXANDER WILSON, M.D., Ch.B., Medical Officer, Scio House, Hospital.

M.B.E. (Civil)

DINES CHANDRA CHAKRAVARTI, F.R.C.S.Ed. Bengal Medical Service. Professor of Clinical and Operative Surgery, Medical College, Calcutta, Bengal.

ROBERT THOMAS MANSFIELD HAYLER. Indian Medical Department, First Class, Assistant Director, School of Tropical Medicine, and Resident Medical Officer, Carmichael Hospital, Calcutta, Bengal.

CATHERINE FRANCES TAYLOR, M.B., B.S. For medical services in Tanganyika Territory.

HAROLD DUNCAN ROSS ZSCHERPEL, M.R.C.S., L.R.C.P. Captain, I.M.S. Superintendent, Central Jail, Peshawar, North-West Frontier Province.

AVICE MARY CAM. Medical Missionary, Maubin District, Burma.

Bar to Kaisar-i-Hind Medal (First Class)

IDA SOPHIA SCUDDER, M.D. Principal, Missionary Medical College for Women, and Superintendent, Missionary Medical College Hospital, Vellore, North Arcot District, Madras.

Kaisar-i-Hind Medal (First Class)

MRS. NILAKANTA SIVAKAMU, M.B., B.S., M.R.C.P.I. Principal Zenana Medical Officer, Bikaner State, Rajputana.

THEODORE HOWARD SOMERVELL, M.B., B.Ch., F.R.C.S. In charge of the London Mission Hospital, Neyyoor, Travancore State, Madras States.

Reproductions of the official medal commemorating Pierre and Marie Curie which was struck on the occasion of the International Anti-Cancer Week last November may be obtained at the price of 60 French francs for the bronze replica and 160 francs for the silver one. An illustration of this medal appeared in the *British Medical Journal* of December 3, 1938, p. 1164. Applications for these reproductions should be addressed to the treasurer of the Union Internationale contre le Cancer, 18, Rue Soufflot, Paris Ve, and cheques or postal warrants be made payable to M. B. Pregel. The first number for 1939 of the *Acta* of this organization will contain a report of the communications delivered during the international week, comprising a section relating to the physics of radium and *x* rays, another to their biological applications, and a third to their technical application. There will also be a detailed and illustrated account of the simultaneous celebrations in various other countries. The commemoration issue of the *Acta* will run to about 300 pages, and its price will be 65 French francs; applications for it should be made similarly to the treasurer, M. B. Pregel, at the address given above.

Local News

ENGLAND AND WALES

Tuberculosis in Wales

In the report for the year ended March 31, 1938, of the King Edward VII Welsh National Memorial Association, which is responsible for the treatment and prevention of tuberculosis in the whole of Wales, Dr. D. A. Powell, principal medical officer to the association, emphasizes the benefits of collapse therapy, which, he points out, is of value also in the early stages of phthisis, "so much so that there may be no justification for submitting patients to ordinary sanatorium treatment for prolonged periods." Analysing the work of the dispensaries, Dr. Powell finds large increases since 1927 in the number of new cases examined for the first time, of attendances, and of consultations with general practitioners, etc., but the greatest increase is in the number of *x*-ray examinations—23,940 in 1937 as compared with 1,010 in 1927. He stresses the need for contact examination, which should include radiological investigation and tuberculin testing if it is not to prove futile in children. The report contains some comparative figures of the work done in the dispensaries in Wales and in England, the figures for England being those for 1936. In Wales many more new cases but fewer contacts per 100 deaths from tuberculosis were examined than in England, and there were more than twice as many *x*-ray but fewer sputum examinations. Home visits by nurses per 100 cases on the register were much fewer in Wales than in England. The results of treatment in institutions in Wales are far from satisfactory; there was quiescence in 34 per cent. of the sputum-negative cases, in 20 per cent. of the sputum-positive Group 1 cases, in 5 per cent. of the sputum-positive Group 2 cases, and in 0.1 per cent. of the sputum-positive Group 3 cases; and this in spite of the fact that in these four groups the following respective percentages of patients stayed over six months (notably larger percentages than in previous years): 31.5, 39.0, 46.3, and 43.1. The deaths from tuberculosis (all forms) show an increase of seventeen over the total for 1936, or an increased death rate of 20 per million. No less than 28 per cent. of all deaths occurred within six months of the patient's first examination by the tuberculosis officer.

Blind Masseurs

It is a quarter of a century since King George V opened the school of massage at the National Institute for the Blind, London, and the annual report ending March 31, 1938, records great achievement in this branch of therapeutic work by the blind. The blind masseur, it says, is to-day recognized by the medical profession and the general public as a fully qualified and dependable healer. During the past year there were thirty-one blind students in training at the Institute's school, and successful results were obtained in the examinations of the Chartered Society of Massage and Medical Gymnastics. An increasing number of younger blind people are taking up this work, and among the students were ex-pupils of Worcester College and Chorleywood College, the National Institute's public schools for blind boys and girls respectively. There were also St. Dunstan men, ex-Service men sent by the Sir Beachcroft Towse Ex-Service Men's Fund, and others from various parts of the Empire. Clinical experience for the senior students is provided by the school's evening clinic, St. George's Hospital, and the Hampstead General Hospital. Treatments at the clinic are supervised by a sighted Sister and a blind chartered masseur, the patients being sent by hospitals and by doctors in panel practice. During the year 9,018 treatments were given. Settlement of newly qualified masseurs and masseuses is considered an important interest of the

National Institute's massage department. A number obtain hospital and clinical appointments, but others set up in private practice. Efforts are made to establish the latter in the districts chosen by them, and approach is made on their behalf to local doctors and the local authorities. Help is given also by the Association of Certificated Blind Masseurs under the presidency of Lord Dawson of Penn. The National Institute's school is now established at 204, Great Portland Street, in the same building that houses the Alfred Eichholz Memorial Clinic.

The Ophthalmological Society's Annual Congress

The annual congress of the Ophthalmological Society of the United Kingdom will be held at the Royal Society of Medicine, Wimpole Street, London, W., on April 20, 21, and 22, 1939. The subject for discussion is "The Problems of Refraction." The openers will be Mr. R. Affleck Greeves, Mr. Charles Goulden, and Mr. A. Harold Levy. Members who wish to take part in this discussion should notify Mr. Frank W. Law (36, Devonshire Place, W.1) before February 28. The Bowman Lecture will be delivered by Professor Weve, his subject being "Diathermy in Ophthalmic Practice." The International Organization against Trachoma and the International Association for the Prevention of Blindness will hold their annual meetings on Wednesday, April 19, at the same venue as that of the Ophthalmological Society. These meetings will be accessible to members of the Congress. The annual dinner of the Society will be held on April 20.

District Nursing

The report for 1937 of the Queen's Institute of District Nursing states that 71,328 midwifery cases (with no doctor engaged for the confinement) were attended during the year, an increase of 3,876 over the previous figure. Just over 25 per cent. of the patients were primiparae. The number of maternal deaths was 143. Of these, twenty-nine were due to sepsis, while eclampsia accounted for eleven and embolism for fifteen. In fifty-three of these fatal cases delivery was not accomplished by the midwife, as it was found necessary to summon medical aid before birth. With regard to district nursing, the number of cases nursed and the number of visits paid show a marked increase on the figures for the previous year. This is largely attributable to influenza, while cases of pneumonia also increased by 1,500. Association of pneumonia with influenza accounted to a great extent for the rise in mortality from this illness from 15.8 to 17 per cent. in England and Wales, the highest incidence in rural districts, the lowest in London. A marked decrease in the number of cases of measles is recorded. Tuberculosis also shows a diminution. The highest mortality from this disease was in Wales.

Centenary of King's College Hospital

The first meeting of the provisional committee to carry out the wish of the Council of King's College that a hospital should be attached to the Medical School was held in the College on May 13, 1839. The object was to secure the lease of a building in Portugal Street which had been occupied as a workhouse. The plans of the original committee took twelve months to carry into effect, so that the hospital was actually opened to patients in April, 1840. The Thanksgiving Service to commemorate the centenary of this event is to be held in St. Paul's Cathedral on Friday, May 12, 1939, at 5.30 p.m. The Duchess of Gloucester, as president of the hospital, has expressed her hope to be present. The date is the birthday of Florence Nightingale, so that the service will also be a thanksgiving for the great services of the nursing profession to the nation. The Lord Mayor and Lady Mayoress will attend in state. The Archbishop of Canterbury has consented to give the address, and the Bishops of London, Southwark, Rochester, and Croydon will also take part in the service. Information on the arrangements for the presentation of offerings and obtaining of seats by individuals as well as corporate bodies can be obtained from the House Governor, King's College Hospital, S.E.5.

Central Midwives Board

The Central Midwives Board for England and Wales at its December meeting granted an application from the Hull Municipal Maternity Hospital for approval for the purpose of providing instruction in the essentials of obstetric analgesia and in the use of a recognized apparatus. A reply from the Royal College of Obstetricians and Gynaecologists to the Board's letter regarding condition (iii) of the latter's ruling on the administration of nitrous oxide and air by midwives was considered. The Board's letter stated that the ruling had been made in the light of the report of the College on analgesics suitable for use by midwives, and that the condition in question had been the subject of criticism, in consequence of which the Board desired the College to review the matter and to give its opinion on the suggestion that the condition should be rescinded. The reply of the College was as follows:

"The Council has considered the request contained in your letter of June 7 and . . . at the present time can only reaffirm its previous recommendation—namely, that when gas-and-air analgesia is administered, one other person, being a State-certified midwife, or a State-registered nurse, or a senior medical student, or a pupil-midwife, should be present at the time of administration in addition to the midwife in charge of the case."

In view of this reply the Board decided that condition (iii) of its ruling regarding the administration of nitrous oxide and air by midwives should not be amended.

Medical Society of London

The second half of the 166th session of the Medical Society of London opens on January 9 with a pathological meeting at 8 p.m. Discussions will be held at 11, Chandos Street, W., at 8.30 p.m., as follows: January 23, poliomyelitis, including artificial aids to respiration; February 13, use and abuse of purgatives; February 27, principles of modern treatment of fractures of the extremities; March 13, coronary thrombosis; March 27, the ocular manifestations of general disease. The Lettsomian Lectures, on "The Surgery of the Gall-bladder and Bile Ducts," will be delivered by Professor G. Grey Turner on February 20 and March 1 and 6, at 9 p.m. The annual general meeting will be held on May 8, at 8 p.m., and will be followed by the Annual Oration, on "Clinical Sense and Clinical Science," by Professor J. A. Ryle.

Neurasthenia Clinic for Public Assistance Cases

The London Public Assistance Committee has experienced difficulties in securing adequate reports in cases of neurasthenia. In long-standing cases particularly, expert medical opinion is desired as to whether return to independence can be assisted by extended use of the facilities available for treatment, by work-finding, or by any form of training. It is proposed to appoint for the purpose special consultants, who would be attached to St. John's Hospital, Battersea, and all persons certified by district medical officers to be suffering from neurasthenia who have been chargeable for more than a month are to be referred to such consultants for examination and special report. The new procedure was due to begin on January 1, and will be reviewed after a year's working. It is estimated that to examine and report upon the existing accumulation of neurasthenic cases in receipt of relief will require the services of consultant psychiatrists working a total of five sessions of two and a half hours each week for about twenty weeks. When such cases have been dealt with only two sessions weekly will be required in respect of new cases. The consultants will be paid on the usual scale for consultants and specialists generally. At the same hospital the establishment of a clinic for patients discharged from the mental observation wards at the hospital has been recently approved.

Central Emergency Committee for the Nursing Profession

The membership and terms of reference of the Committee appointed by the Minister of Health (as announced early in December) to compile a register of nurses and nursing auxiliaries available for service in a national emergency are as follows:

Sir Malcolm Delevingne, Chairman.
Miss E. M. Musson, General Nursing Council.
Sir Comyns Berkeley, M.D., Central Midwives Board.
Miss D. S. Coode, College of Nursing.
Dame Beryl Oliver, British Red Cross Society.
Lady Perrott, Order of St. John.
The Dowager Marchioness of Reading, Women's Voluntary Services for Civil Defence.
Dr. G. C. Anderson, British Medical Association.
Sir Frederick Menzies, M.D., London County Council.
Mr. E. W. Cemlyn-Jones, County Councils Association.
Alderman W. E. Wilford, Association of Municipal Corporations.
Dr. James Ferguson, Society of Medical Officers of Health.
Mr. W. H. Harper, British Hospitals Association.
Miss B. M. Martin, Admiralty.
Miss C. M. Roy, War Office.
Miss E. M. Blair, Air Ministry.
Colonel Moore, M.B., Ministry of Pensions.
Mr. H. N. de Villiers, Ministry of Labour.
Dr. N. W. Hammer, Home Office, Air Raid Precautions Department.
Miss Z. L. Puxley, Ministry of Health.
(Miss Puxley will also act as secretary to the committee.)

The functions of the committee will be: (*a*) to ascertain the nursing personnel available in England and Wales by collecting the numbers of nurses in the employment of voluntary and statutory organizations and by the compilation and maintenance of a register of all other nurses and nurse assistants who are prepared to offer their services in an emergency; and (*b*) to compile and maintain a register of nursing auxiliaries who are prepared to offer their services in an emergency.

SCOTLAND

Nursing Emergency Committee

The Secretary of State for Scotland will shortly set up a Scottish Nursing Central Emergency Committee, which will exercise in relation to nurses similar functions to those exercised in relation to medical practitioners by the Central Emergency Committee of the British Medical Association. The main task of the committee will be to direct the setting up of a register which will cover all the nurses and assistant nurses in Scotland and indicate the services which they will be prepared to render in an emergency. For the compilation of the register the committee will have the assistance of the College of Nursing. The committee will also compile, with the aid of the St. Andrew's Ambulance Association and the British Red Cross Society, a register of nursing auxiliaries who are prepared to offer their services in an emergency. Sir John Jeffrey will be chairman of the committee, and the members include:

Miss Husband, Matron of Glasgow Royal Infirmary (General Nursing Council for Scotland), Miss F. N. Udell (College of Nursing), Lady Ruth Balfour, M.B. (Women's Voluntary Services), Brigadier-General J. D. Crosbie (Association of County Councils in Scotland), Ex-Provost J. R. Rutherford (Convention of Royal Burghs), Dr. A. S. M. Macgregor (Association of Councils of Counties of Cities in Scotland), Dr. W. G. Clark (Society of Medical Officers of Health), Dr. J. D. Comrie (British Medical Association), Colonel D. J. Mackintosh (St. Andrew's Ambulance Association), Colonel G. H. Edington (British Red Cross Society), Dr. N. W. Hammer (Home Office, A.R.P. Department), Miss J. K. Gillanders (Admiralty), Miss Isabella C. Dewar (Central Midwives Board for Scotland), Dr. J. M. Mackintosh (Chief Medical Officer, Department of Health for Scotland), Mr. W. S. Murrie (Department of Health for Scotland). The following associations and Government Departments have also been invited to nominate representatives: British Hospitals Association (Scottish Branch), Ministry of Pensions, War Office, Air Ministry.

Scottish Medical Graduations

At the December medical graduation ceremony in Aberdeen Principal W. Hamilton Fyfe conferred the degree of M.D. on five graduates and those of M.B., Ch.B. on twenty-two graduands. Addressing the graduands he said that whatever branch of the medical profession they ultimately chose they would find a challenge for the finest qualities of brain, character, and physical strength. The medical course had been mainly a mental one, and their memories had been stored with facts for future use, but they must conserve and increase their knowledge and also strengthen their character and keep themselves in vigorous bodily health. The heaviest demands were made on the doctor in practice, who had to win a victory over continual fatigue and also over irritation which might be produced by the stupidity of patients. He must understand the mind as well as the body of sick people, and he required the sympathy which could see what was ludicrous and tiresome in human beings without liking them the less. They should keep their sympathies alive by developing wide interests, in literature, in art, in music, and above all in people.

At a graduation ceremony in Edinburgh University on December 16 Principal Sir Thomas Holland conferred the degree of M.D. upon fourteen graduates, and those of M.B., Ch.B. upon thirty-eight graduands.

Lipton Trust and Glasgow Hospitals

A ceremony for distribution of the first instalment of payments under the will of the late Sir Thomas Lipton was held in the City Chambers, Glasgow, on December 15. Lord Provost Dollan, who presided, recalled that Sir Thomas Lipton was a Glasgow boy born under humble circumstances who made a great career for himself and amassed a considerable fortune. He had given £100,000 to help working-class mothers in the city of Glasgow, and this was administered by the Glasgow Society of Social Service. He had also bequeathed a large part of his estate in America to Glasgow local charities. The Lord Provost handed cheques, each for £32,000, to the chairmen of the Royal Infirmary, the Western Infirmary, the Victoria Infirmary, the Royal Hospital for Sick Children, and Glasgow Eye Infirmary. Sir James Macfarlane, in expressing the thanks of the infirmaries, said that he noticed that the present distribution was one of accumulated dividends, so that it was really a payment from revenue and not from capital. The capital would ultimately come to the charities of Glasgow, and at present remained untouched.

Scottish Art Exhibition in London

The Exhibition of Scottish Art, which opens to-day at the Royal Academy, Burlington House, W., enables the British public to realize for the first time the great achievements of Scottish artists throughout the last three centuries. It includes works from the earliest native painters down to artists who have died recently. A prominent feature of the exhibition consists of specially selected groups of silver, pewter, arms, embroidery, Jacobite relics, etc., all of which are of Scottish origin. Among the many famous pictures to be seen at the exhibition are those lent by the King. There are in all thirty-nine of Raeburn's finest works, the best collection of Raeburns ever seen together in one place; many of them have never been seen by the public before. The portraits by Allan Ramsay, the celebrated court painter, which aroused great admiration at the Glasgow Exhibition, include "Norman, 22nd Chief of Macleod," from Dunvegan Castle in the Isle of Skye. The exhibition has been

drawn from the most famous collections of England and Scotland, from every county between Tweed and Pentland Firth, and is a national display of Scotland's contribution to the arts. It is open on weekdays only, from 9.30 a.m. to 7 p.m. (Thursdays 10 p.m.); admission, 1s. 6d.

INDIA

Weil's Disease in Calcutta

The annual report for 1937 of the Calcutta School of Tropical Medicine and the Carmichael Hospital for Tropical Diseases includes an account of a special investigation concerning leptospiral jaundice (Weil's disease) in India. From observation of several cases occurring in Calcutta the disease does not appear to be confined to people engaged in any particular occupation, nor did any of the patients give a history of river bathing or other cause which might incriminate dirty water as the source of infection. All, however, had lived in rat-infested houses. The report states that evidence is accumulating that there exists more than one serological type of leptospira in Calcutta. Should this assumption be correct, seroreaction as a diagnostic method will not only be valueless but also misleading, so long as all the local strains have not been isolated. Curiously enough the incidence of leptospiral infection in rats in Calcutta appears to be very low. Of sixty-two animals examined in the course of six months, including two trapped in the house of one of the patients, all proved negative. Of between three and four hundred examined in previous years only two showed infection. It was presumed, however, that some of these rats, all of which were full grown, might have acquired immunity from an infection in early life. With a view to determining whether there was any degree of immunity in these rats, protection tests were carried out with the sera of some of them against the local human strain; results, however, were invariably negative. Further work is in progress concerning the rat as a possible carrier of the disease in Calcutta, and when sufficient data are available regarding the disease, which is now being studied from different points of view, it is hoped to publish a detailed account.

Rural Development of the United Provinces

The year 1936 was one of intense activity for members of the district health staff of the United Provinces, since they were called upon to co-operate actively in the Government's programme for rural development. In the report of the director of public health which relates to that year Dr. K. P. Mathur remarks that public health work in villages is generally looked upon with indifference unless it is combined with medical relief. The general plan of rural development work was reorganized to meet suggestions made by the Government of India. After a year's working 163 villages had been improved on sanitary lines, wells in them being made healthy, while soakage pit, manure pits, sanitary types of cowsheds, ventilators, and bathing enclosures for women were provided, and health propaganda and maternity work were intensified. Public health by-laws were framed in most districts, but are only called into action where all persuasion has failed, the level of the fines inflicted being kept low. The district health service was extended in 1936 to four districts; the number of village dispensaries increased in the United Provinces from 3,686 to 4,593. The village medicine chests, designed by the public health department and issued to villages under the rural development scheme in 1935, proved very popular, and were greatly appreciated by the local authorities. The soakage pits were generally welcomed, but it was found that their success depended on the nature of the soil and the availability of soakage material such as burnt bricks and ballast. The trench pattern latrines did not win favour, and their abandonment has been ordered. Manure pits are more widely used. The formation of sanitary committees under the rural development scheme awakened local enthusiasm in public health matters; no model village was laid out during the year, but model houses were constructed in certain villages. In many other villages existing houses were improved by the provision of ventilators. As many as 1,326 new sanitary wells were dug during the year, but still there are no water supplies in 567 villages, and in over 1,100 villages the supply is situated very far away from the houses; applications are therefore to be made to the Board of Public Health for financial aid in obtaining a wholesome water supply in these cases. The health unit scheme in Partabgarh district is being continued with the aid of the Rockefeller Foundation, and the scheme of treatment with cinchona and plasmoquine was extended. This scheme secures the distribution of cinchona through local agencies in malarial districts where dispensaries are few and widely separated. In Lucknow, Hardoi, and Unao districts this method of treatment reduced materially the number of relapses. Serious efforts were made to train the indigenous native midwives throughout the Upper Provinces in connexion with the rural development scheme. A training centre is to be built in Lucknow as soon as a suitable plot of land can be obtained. There is no Red Cross maternity hospital in the United Provinces, but clinics are held at the maternity and child welfare centres, ante-natal and post-natal visits are paid, and local dais are being trained, while propaganda instruction has been intensified. The examination of school children brought to light a fairly high percentage of physical defects, but these are diminishing in places where health education and the home environment are being improved. The percentage of dental caries in rural areas was 10.7; pyorrhoea was found in 6.8 per cent. in urban areas, especially in the higher age groups, but only in 1.7 in rural areas. Gains in weight of school children were noticeable in places where free pasteurized milk was supplied.

Reports of Societies

VITAMIN C IN HEALTH AND DISEASE

At a meeting of the Manchester Pathological Society on December 14, Dr. B. PORTNOY gave an address on vitamin C in health and disease.

Dr. Portnoy outlined the properties of synthetic ascorbic acid, and pointed out that such preparations might be of value in cases in which large doses of vitamin C had to be administered, or in the case of infants allergic or intolerant to fruit juices. The vitamin had a very general distribution in the body, and was present in every cell. It was responsible for the control of the production of intracellular cement substances of mesodermal origin, such as collagen, vascular endothelium, cartilage, and the matrices of bone; and, secondly, it was related to cellular respiration. The high concentration of vitamin C in glandular tissues, the structure of its molecule, and the ease with which it was reversibly oxidized suggested that it acted as a respiratory catalyst, aiding cellular respiration by acting as a hydrogen transport. Bearing these functions in mind, the pathology of scorbutic states became more comprehensible.

Whether the vitamin had a definite causal relationship to any pathological process other than scurvy was as yet uncertain. An ample supply was necessary for the diet of pregnant or nursing women, and as the vitamin was necessary for the production of healthy granulation tissue its use was indicated pre- and post-operatively in all cases in which a history of low vitamin C intake was obtained. This aspect of the problem was especially emphasized in connexion with the healing of wounds, and experimental evidence was put forward in support of

this hypothesis. The relation of vitamin C to endocrine diseases and suggestions that it might be specifically related to hyperthyroidism, diabetes, and Addison's disease were discussed. Dr. Portnoy did not believe that there was any justification for the association of vitamin C with any haemorrhagic state other than scurvy. It was mentioned that ascorbic acid acted as a diuretic when administered orally in certain cases of cardiac disease, and it was also of apparent value in controlling intolerance to arsenicals.

Correspondence

Mechanical Respirators

SIR,—I wonder how it came about that Lord Nuffield was persuaded to provide no fewer than 5,000 mechanical respirators of a particular type for distribution to any hospital in this country and the Empire which chose to ask for one. It is incredible that advice of this kind could have been given by any person who had any practical experience or knowledge of mechanical respirators. It is a thousand pities that the munificent generosity of one who has been one of the greatest benefactors of medical science in recent years should have been exploited in this way. My only object in writing this letter is to express the fervent hope that even now it may not be too late to prevent such a wanton waste of private benevolence.

Anyone who knows anything at all about mechanical respirators must surely know that, like most other pieces of mechanism, they are passing through the usual period of evolution in the course of which we are learning more and more with regard to their design, construction, and use in the treatment of certain types of disease. During the past four years the mechanical respirator has been in frequent use in the London County Council hospitals, and we have learned a great deal about them from practical experience. Necessarily, by reason of the magnitude of the Council's hospital service and the fact that all the hospitals where they are or have been in use are under one control, we have "pooled" a vast fund of valuable experience. It was for this reason that the Council recently organized an exhibition of the various types of mechanical respirator, past and present, and provided demonstrations and useful practical literature thereon for the particular benefit of the medical profession and others interested. If there was one lesson above all others to be learned from such an exhibition and demonstration it was that mechanical respirators are still in the process of being improved in design and construction and the use to which they are put, as well as the overwhelming importance of the trained personnel—medical, nursing, and engineering—required for their proper use.

It is therefore the height of folly at this stage to proceed to standardize any one type, to turn it out in thousands by a process of "mass production"; and, perhaps worst mistake of all, to distribute it to all and sundry, when it is certain that the vast majority of the hospitals that will apply for one have not the slightest idea how to use a mechanical respirator properly. Lastly, who was responsible for advising that no fewer than 5,000 mechanical respirators were required? If anything like 500 were available for England and Wales I venture to forecast they would prove in practice to be more than sufficient, always provided, of course, that they are properly used.—I am, etc.,

London, S.W., Dec. 23, 1938. FREDERICK MENZIES.

Medical Uses of Radium

SIR,—In your account of the annual report of the Medical Research Council on the medical uses of radium (December 24, 1938, p. 1326) attention is drawn to a warning from the Marie Curie Hospital concerning the radiological treatment of menorrhagia in young women in view of the possible danger of the inheritance of abnormalities due to radiation effects on the ovaries. The remarks were especially intended to suggest that the custom of giving an excessively large radium dosage in order to sterilize the patient is to be deprecated because of the assumption of the possibility of the inheritance of irreversible gene mutations resulting in abnormal births.

The high-intensity prolonged doses—2,500 to 3,000 M.E.H. given in forty-eight hours—in an anatomically normal uterus are not without danger of serious early and late reactions: varices, ulcers, even necrosis of the entire lining membrane necessitating hysterectomy have been described; there are also reports of many cases of cervical stenosis and other atrophic conditions following the treatment of non-malignant haemorrhage in young women. The immediate danger to the individual being treated is more important than the possibility of remote late effects, which, moreover, have not been definitely shown to occur, and in any case would be extremely rare. More researches relating to this important problem are required. There is no question as to the value of radiation treatment when properly applied in suitable cases; there is also no doubt that it is definitely preferable to hysterectomy for persistent haemorrhage.—I am, etc.,

The Marie Curie Hospital, 2, Fitzjohn's Avenue, N.W.3, Dec. 29, 1938. E. HURDON.

Cyclopropane and Pulmonary Atelectasis

SIR,—I have read with great interest the letter from Dr. Philip Ayre in your issue of December 17, 1938 (p. 1279), on the subject of administering cyclopropane with air. His method is certainly ingenious, and great credit is due to him for his inventiveness, his technique of "open endotracheal" anaesthesia being a very real advance in the story of anaesthetics.

Nevertheless, although I have not had Dr. Ayre's wide anaesthetic experience, I beg leave to doubt that a high percentage of oxygen, even if respired for a prolonged time, could prove capable of causing either pulmonary collapse or mental instability. Such results are not obtained in persons using the Davies apparatus for high-altitude aeroplane flights, nor do we expect these complications in patients treated in oxygen tents. Assuming that cyclopropane acts by virtue of its rapid absorption, to the partial exclusion of oxygen, in combination with a specific action due to its lipoid solubility, it would appear that there is a very real danger of producing a relative overdose of cyclopropane if the percentage of oxygen administered with it be reduced.

I entirely concur with Dr. Ayre as to the multitudinous factors concerned in the causation of pulmonary complications, but I feel that the greatest stress must be laid upon one aetiological point: the use of heavy premedication and basal hypnosis. I have myself administered cyclopropane on numerous occasions, sometimes for as long as three hours, but I have not yet seen a case of pulmonary collapse or mental derangement following its use. I have, however, seen both these unfortunate sequelae after the use of evipan sodium, used as an induction to general inhalational anaesthesia; and in cases where post-anaesthetic complications arose after combined evipan

sodium and cyclopropane anaesthesia I should be much more inclined to blame the basal hypnotic than to suggest high oxygen percentage as the cause. Indeed, my own results with evipan sodium have been so unsatisfactory in this regard that I have practically abandoned it, and I now only use it in cases where it is specially indicated.

In conclusion, I should like to add that I almost invariably use the ring type carbon dioxide absorber, and I much prefer it to the Waters's type for three reasons: it is easier to adapt for endotracheal anaesthesia; the bag may be shut off when removing the face-piece for the insertion of an airway, etc., thus minimizing cyclopropane loss; it is possible to use it with the soda-lime canister in or out of circuit. My own apparatus is not open to Dr. Ayre's objection as to the mixing of the oxygen inflow with the contents of the bag, as the oxygen inlet is situated at the face-piece, as in the Waters's absorber.—I am, etc.,

M. H. ARMSTRONG DAVISON, M.D., D.A.

Newcastle-upon-Tyne, Dec. 21, 1938.

New Menstruation Toilet

SIR,—I should like to endorse the comments made by Dr. Margaret Emslie (*Journal*, December 17, 1938, p. 1282) on the advantages of a self-made plug of cotton-wool for menstrual toilet. I have recommended it for upwards of fourteen years to a wide range of patients and friends, and I have never encountered any untoward results. The fact that it is soft and can be made to fit the wearer exactly is all-important from the point of view of comfort and the prevention of vaginal irritation. Virginity does not preclude its use. The negligible cost and ease of disposal promote frequency of removal and replacement, so that the total result is more aseptic and cleanly than is that of the external pad. Women who have ever worn such vaginal tampons are unlikely to be persuaded to return to the marked discomfort, chafing, and uncleanly odours of the old-fashioned methods. It would seem, therefore, that the efforts of their medical advisers had better be directed, as indicated by Dr. Emslie, towards recommending the right type of tampon frequently changed rather than towards attempting the impossible—namely, to stamp out their use.—I am, etc.,

Exeter, Dec. 20, 1938. E. JOYCE PARTRIDGE.

Illegal Operations

SIR,—In the discussion on illegal operations at the West London Medico-Chirurgical Society on December 2, 1938, Mr. Aleck Bourne stated that "nothing definite was codified until the Act of 1861." This is not so, and in the interests of historical accuracy I desire to call attention to the following facts.

About 1290 there was published a work by Fleta, a commentary on English law, in which occurred the following:

"Whoever shall have overlaid a pregnant woman, or who shall have given her drugs or blows, in such a sort to procure abortion is by law a homicide, and in like maner whover shall have given or taken drugs to the intent that no generation or conception may take place, also the woman commits homicide, who by potions and drugs of that sort shall have destroyed her animate child in her womb."

Thus it will be seen that the Common Law of over five hundred years ago regarded abortion as a very serious offence, and in many respects this Common Law is similar to the statute law of to-day. The first actual Act of Parliament dealing with abortion was passed in 1803. By this Act the attempt to procure by means of drugs abortion on a woman quick with child was punishable with death, whereas if the woman were not quick with child the punishment was transportation or imprisonment, whether the attempt was made by drugs or instruments. There was a remarkable oversight in this Act, for there is no mention of attempts to procure abortion on women quick with child by means of instruments. This Act was repealed in 1828, and another took its place which remedied the omission referred to. The Act of 1828 was replaced by another in 1837, which altered the law in two important respects—the distinction between women quick with child and women not quick was abolished, as was likewise the death penalty.

The present statute law of abortion is contained in Sections 58 and 59 of the Offences Against the Person Act, 1861 (modified as regards punishment by the Statute Law Revision Act, 1893, and the Penal Servitude Act, 1891). There is also the Infant Life (Preservation) Act, 1929, which makes the procuring of abortion legal under certain circumstances—namely, that it is done to save the life of the mother, and that the seventh month of pregnancy has been reached.—I am, etc.,

Hove, Dec. 18, 1938. L. A. PARRY, F.R.C.S.

Domiciliary Emergency Treatment of Eclampsia

SIR,—I have read with interest Dr. Rufus C. Thomas's letter on the above subject (*Journal*, December 24, 1938), but conditions in this county do not compare with an area like the borough of Croydon. A large part of this county is sparsely populated and I find that a relatively large number of cases of eclampsia come from the country areas. It may also interest Dr. Thomas to know that at one time in the period under review 70 per cent. of the insured population were unemployed, and although a patient is often willing to attend an ante-natal clinic she is prevented from so doing by the long distance to be travelled plus the cost of travelling. I did not state an important factor in my note—that the general practitioner decides whether a case should be sent to hospital or whether the emergency team should be called.

All cases of hypertension with a diastolic pressure of 90 mm. Hg and over are admitted for treatment and are dealt with on the lines suggested by Dr. Thomas, with this exception, that a limit of 100 mm. Hg diastolic pressure is reached before induction of labour is attempted in the absence of other signs of toxaemia. I do not agree with Dr. Thomas that cases with a diastolic pressure of 90 mm. Hg should have induction of labour performed in the absence of other signs of toxaemia. This, in my opinion, would entail a great wastage of infant life, as many of these children die and premature children are not an asset to any nation. The only redeeming feature of inducing labour with a diastolic pressure of 90 mm. Hg is that it ensures that cases will not develop eclampsia during labour, while the higher the pressure the greater is the likelihood of eclampsia occurring during parturition.

It is a well-known fact that eclampsia is more common in one part of the country than another, and Lanarkshire probably holds a unique position in having a high incidence, whereas in the City of London the incidence is considerably less, according to reports; this difference may be enhanced to a certain extent by the greater amount of ante-natal work carried out. The number of cases of eclampsia is not increasing but rather remaining stationary, and the cases vary extraordinarily in number and severity from year to year. Thus, indoor alone from 1928 to 1932 the numbers were 24, 22, 38, 8, and 9; and from 1933 to 1937, indoor and emergency team cases,

17, 23, 30, 31, and 28. I do not know of any other cases within the local authority's area during the period 1933 to 1937, as all such cases are immediately reported to the Maternity Hospital; a survey of the medical officer of health's reports agrees with this statement. Cases 6 and 10 in my annual report for 1937 (page 71) showed improvement after admission and were allowed to continue to normal labour. Labour itself increases the blood pressure and often precipitates an attack of eclampsia, and in the two cases referred to the blood pressure did increase considerably, as events proved, after the onset of labour. —I am, etc.,

Lanark, Dec. 29, 1938. H. J. THOMSON.

SIR,—The letter of Dr. Rufus C. Thomas in your issue of December 24 (p. 1336) calls for comment. He writes that "the routine adopted in the Croydon Obstetric Service is that all cases seen at the ante-natal clinics whose diastolic blood pressure is 90 or over, with or without albuminuria, are admitted to hospital, *and if the usual dietary and other treatment does not result in subsidence within about ten days the pregnancy is terminated.*" (Italics mine.)

What next shall we be taught by our obstetrical specialist colleagues? My practice is a rural one, and I have looked over my notes since 1915. I find that I have records of 100 cases with diastolic blood pressures of 90 or over, and of these forty-nine had albuminuria. All were treated upon common-sense lines such as that advocated by Fitzgibbon, modified according to the severity of the individual case, not one of them gave me the slightest anxiety, and all were delivered of healthy full-term babies. All had diastolic blood pressures of 90 or over, many slight albuminuria, right up to the termination of their pregnancy. One case had a diastolic pressure plus albuminuria of 160, had a healthy full-term baby, and no symptoms hinting at eclampsia.

I have not had an eclampsia since 1923, and only three since 1915. All three were primiparae, I had not been engaged for their confinements, and there had been no ante-natal care. In all three the mothers did quite well, although the babies were stillborn, and all had subsequent pregnancies without high blood pressure or albuminuria, and healthy confinements, but careful guidance during the ante-natal period. I very often find a sharp rise of blood pressure a few weeks prior to full term, and I think this period should be very carefully watched, and I am very strict in my treatment but, in such cases, I would never dream of inducing labour. It seems to me terrible that such methods should be allowed in public institutions. If the methods of these modern clinics go on with their Caesareans, inductions of labour, and so on, we shall soon be advised to induce labour in the case of prospective mothers with running noses in order to avoid dry labours! —I am, etc.,

Tain, Ross-shire, Dec. 25, 1938. E. K. MACKENZIE.

Treatment of Acute Osteomyelitis

SIR,—I have read with great interest the article by Mr. Alex. Mitchell on the treatment of acute osteomyelitis by uleron (*Journal*, December 10, 1938, p. 1200), but question whether his excellent results are not more rightly attributable to the conservative attitude adopted than to the use of this new "curative agent." We are all unfortunately aware of the high mortality associated with acute osteomyelitis, examples of recorded figures being: ninety-one cases with eighteen deaths—20 per cent., Williams (1931); forty cases with thirteen deaths—32 per cent., Lloyd (1931); fifty-six cases with thirteen deaths—23 per cent., Fraser (1934). More favourable results are quoted by the advocates of conservative treatment. The late Mr. Tyrrell-Gray stated at a meeting of the Section of Paediatrics at the Annual Meeting of the British Medical Association in 1934 that for the past five years he had not operated on a single case of osteomyelitis, and that in that period he only had one death. Holman (1934), in an article warmly advocating expectant treatment, quoted thirty-one cases with three deaths (10 per cent.). He states: "Two of these deaths occurred in cases of acute septicaemia—as in both cases early operation was performed they cannot be used in argument against expectant treatment." Baggio (1937) records eleven cases of acute osteomyelitis in which no operation was performed, with only one death.

Case II reported by Mr. Mitchell—"the child was gravely ill and it was considered that any operative procedure was not justified"—did exceptionally well. Case III —"he was very ill, his temperature being 104° and pulse 160"—was not operated on till the seventh day of his illness. It may well be that the conservative attitude adopted was the deciding factor in the good results obtained in these cases. Some modern textbooks still advocate extensive operations (Maingot, 1936), but I feel that conservative treatment is the key to a lower mortality rate from acute osteomyelitis, and my own rather limited experience tends to bear out this contention; though, following Mr. Mitchell's advice, I shall certainly try uleron in future.—I am, etc.,

Lincoln, Dec. 20, 1938. G. A. BAGOT WALTERS.

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The Discovery of Typhoid Mary

SIR,—The death of Miss Mary Mallon, widely known as "Typhoid Mary," on November 11, 1938, has brought forth such a flood of misstatement in which my name as her discoverer has been associated that I feel compelled to do something to defend my reputation. In the misstatements referred to I regret to say that the lay press is not alone at fault. Medical periodicals, bulletins of public health departments, and even official epidemiologists, who certainly have no excuse to offer for ignorance in this matter, are equally to blame.

On tracking the statements down, I have found that a flippant article, without pretence of accuracy, written by a free-lance journalist for an allegedly smart periodical has been the source of much of the misinformation. Instead of taking the trouble to look up my professional papers in the *Journal of the American Medical Association* (1907, **48**, 2019) or the *Military Surgeon* (July, 1919), in which I described my investigation, the writers have turned to the popular periodical and recommended it to the medical profession as substantially correct. The misstatements substitute a wholly imaginary account not only of the investigation itself but of the circumstances which led up to it, and rob me of whatever credit belongs to the discovery of the first typhoid carrier to be found in America and (to the time of her death) the most famous carrier anywhere.

This is not the place for me to describe again the investigation which led me to find "Typhoid Mary" and to recommend the New York City Department of Health

to take her into custody. Suffice it to say that I did not stumble upon her in the course of routine duties as an employee of the Health Department or as a blind disciple of Robert Koch. I was at the time a thoroughly trained and experienced epidemic fighter who had seen service in the laboratory and the field. I was acquainted with the German work and the English views as to the danger of urinary carriers of typhoid germs. The discovery of "Typhoid Mary" is rather to be regarded as an outcome of my work for the control of the epidemic of over 1,300 cases of typhoid at Ithaca, N.Y., in 1903, where I had seen typhoid spread from person to person and initiated energetic measures to prevent it.

Just as I had been called from private practice by the New York State Department of Health to go to Ithaca and use every effort, in the name of the State, to put a stop to the epidemic, I was later called on by the owner of a private estate at Oyster Bay, N.Y., to investigate and if possible remove the cloud of mystery which hung over this property as a result of an outbreak of typhoid which had occurred there in the summer of 1906. It was a difficult investigation, partly because I was not called for more than six months after the outbreak and the people had become separated and the house vacated. The cook (Miss Mallon) could not be found for some months, and then proved most refractory.

It may be of interest for me to state that the Oyster Bay epidemic, like most of the other outbreaks which I eventually traced to this woman, had, before I entered upon the case, been carefully studied by other investigators and ascribed with more or less plausibility to other causes.—I am, etc.,

GEORGE A. SOPER, Ph.D.,
Honorary Fellow, Royal Sanitary Institute.

Great Neck, N.Y., Dec. 16, 1938.

Seasonal Influence of Rheumatic Fever

SIR,—I happened to read recently the article by Dr. Arnold B. Rowlands on the above in the *Journal* of July 2, 1938 (p. 15), and I should like to make a comment on the statistical interpretation of the data.

It will be remembered that five graphs are given, as follows: Graphs 1 and 3, seasonal variations of temperature and relative humidity at Greenwich; Graphs 2 and 4, rates of change of Graphs 1 and 3; Graph 5, seasonal incidence of rheumatic fever in London. Graph 5 shows a close resemblance to Graphs 2 and 4, which is supported by significant correlation coefficients $r(25) = -0.86$ and $r(45) = 0.85$. These correlations, together with other considerations, lead the author to conclude that one of the factors controlling the seasonal incidence of rheumatic fever in this country is the reciprocal acceleration of temperature and relative humidity.

I should like to suggest, however, that further consideration of the problem is necessary before the correlation coefficients can be put forward as purely statistical evidence for this conclusion. It appears to me that the correlation coefficient r(25) (say) is high, because the two graphs 2 and 5, have the same general form; but it is possible that the similarity between the two is in the nature of a coincidence. There may be, for instance, some other factor, not necessarily climatic, which may happen to have the same form as Graph 2, and which may really be responsible for the form of Graph 5. (I speak as a layman, and therefore am prepared to be told that such a factor cannot exist.)

Before the evidence of correlations can be taken as conclusive I suggest that harmonic curves be fitted to Graphs 2 and 5 (say, by the method of least squares), and that departures from these curves in corresponding months be correlated. Data for several years could be used, and in this way it could be shown whether or not a decrease in the rate of change of temperature during a particular month below the normal rate of change for that time of the year led, on the whole, to an increase in the incidence of rheumatic fever over the normal for that month.

I should like to repeat that I am in no way fitted to comment on the medical aspect of the above investigation, but am merely attempting to criticize the statistical argument used.—I am, etc.,

Farnham Common, Dec. 28, 1938. F. GARWOOD, Ph.D.

Prevention of Tuberculosis

SIR,—In his paper in the *Journal* of December 24, 1938 (p. 1297), Dr. D. M. Dunlop rightly emphasizes that a tuberculous case may show recognizable signs of tuberculous intoxication at a stage when physical signs in the chest may be very difficult to detect.

A little over a year ago I was asked to overhaul a young American lady who was crossing to Europe. I had treated this patient on world cruises and other Atlantic crossings over a number of years. On this occasion her chief complaint was that she had been feeling run down for the past six months. Though she was a well-nourished person, something in her appearance suggested that she might have contracted tuberculosis. She told me that she had had her chest thoroughly examined on two occasions recently, and had been assured there was nothing wrong. I myself was unable to find any physical signs on very careful examination, and told her so. In spite of this her appearance worried me, and as an afterthought I asked her to try and bring up a little sputum. I prepared and stained a film in the usual way, and after a prolonged examination I succeeded in picking out a single tubercle bacillus.

I instructed the patient to have her chest *x*-rayed as soon as she landed, and this was done in Paris. I received a message in return saying that a small lesion had been found in one apex. This was considered to be so slight that two or three months in Switzerland could be expected to put things right.

Unfortunately the disease continued to advance, and in four months the patient was dead.—I am, etc.,

Rustington, Dec. 24, 1938. A. GARDNER, M.B.

Weil's Disease

SIR,—It is with great interest that I have read the paper by Dr. Kenneth M. Robertson on Weil's disease in the *Journal* of December 24, 1938 (p. 1300).

During the war I had the opportunity of observing a small outbreak of Weil's disease (eleven cases with one subsequent isolated case). The cases occurred in the summer and autumn of 1915 and 1916 in the Vosges Mountains. The characteristic feature of the disease was a temperature curve which rose up to 104° F., and at the tenth day the crisis came. At this point the patient either recovered completely or died, or a period of normal temperature was followed by one or sometimes two further periods of raised temperature, as in relapsing fever.

In all my cases the combination of jaundice, nephritis, and haemorrhages was present. The jaundice was sometimes very marked and in others less. The haemorrhages could be seen as small scattered spots in the skin and mucous membranes, and I remember a case where a patient died from a severe haemorrhage into the renal capsule. Two of the eleven patients died. The leucocyte count seemed to be of value in so far as the leucocytosis was up to 13,000, due to an increase of polymorphs, which

persisted in the fatal cases. In patients who recovered, crisis and improvement were preceded by an increase of lymphocytes and eosinophils. At that time specific antiserum was not available and convalescent serum was used for treatment.

The diagnosis was confirmed by guinea-pig inoculation. Animals inoculated with the blood taken during the first three to four days became infected with the typical signs of Weil's disease, and spirochaetes were found in the organs eight to ten days later. The patients' blood subsequently became free from spirochaetes, but they were shown to be present in the urine by means of guinea-pig inoculation. This seems to be of importance from the epidemic point of view, and I remember an isolated case in which the clinical diagnosis was catarrhal jaundice. The injection of the patient's urine into guinea-pigs after his recovery proved that he had in fact been suffering from Weil's disease and was still excreting spirochaetes. Spirochaetes have been found in the urine as long as one hundred days after recovery from the disease.—I am, etc.,

London, W.1, Dec. 29, 1938. ERNST M. FRAENKEL.

Sanitation and Holiday Camping

SIR,—I should like to raise a point which I think is being overlooked by the public health authorities in these days of quick transport—that is, the ever-increasing number of caravans, tents, etc., which are infesting every part of the country during the summer months without adequate sanitary arrangements being made for their accommodation.

In the old days before motoring became universal various bodies would camp out for a week or two on fresh ground, and for the remaining part of the year the ground was free from this kind of thing and could become sweet and wholesome again; but to-day any piece of waste land near the sea is crowded with caravans and tents from May to the end of September, and if one passes on a summer evening one's nose makes one feel that the sanitation is anything but as it should be.

The seaside boarding-house proprietor has to pay heavy rates to keep sanitation, water supply, etc., up to the standard required by the local authorities, and in my opinion those who let out ground for camping for the whole of the summer and receive quite a good return for so doing should be compelled to arrange proper sanitation, drainage, etc., in the same way.

It is certainly becoming evident that if this abuse is allowed to go on increasing at its present rate it will become a menace to the health of the whole community.—I am, etc.,

Burnham-on-Sea, Dec. 31, 1938. R. COATES.

Ulcerative Colitis

SIR,—I would like to refer to the article on ulcerative colitis by Dr. E. R. Cullinan in the *Journal* of December 31, 1938 (p. 1351).

It should be remembered that bacillary dysentery is comparatively common in agricultural districts in this country, where water supplies are obtained from domestic wells, often defective and in proximity to leaky privies. I have seen many cases of typical clinical bacillary dysentery in such places and verified the cause both bacteriologically and serologically.

In his definition Dr. Cullinan refers to "idiopathic ulcerative colitis." In these days the term "idiopathic" needs to be used with circumspection in any connexion; but I doubt whether it could ever be justified when applied to ulcerative colitis. I can find nothing in his description of the incidence, onset, symptoms, physical signs, stools, blood, sigmoidoscopic appearances, or complications incompatible with chronic bacillary dysentery.

It might have been instructive if Dr. Cullinan had ascertained whether the patients in his series were town or country dwellers, temporary or permanent, at the time of the original onset of the disease. This may happen even during an afternoon's picnic in the country. People in this country do not realize that an attack of diarrhoea may be due to a mild bacillary dysentery; effective treatment is overlooked at the time when it is most essential, and they run the risk of developing the chronic form.

It is many years since I came to the conclusion that ulcerative colitis does not exist as a separate entity apart from chronic bacillary dysentery. Of the presence of a natural reservoir of infection in this country considerably greater than is generally realized I have no doubt; nor of the fact that the majority of cases are mild and either are overlooked or do not trouble to seek medical advice. Only the worst are likely to be notified. I feel certain that it is from this natural reservoir that our cases of so-called ulcerative colitis arise.—I am, etc.,

Brookwood, Dec. 31, 1938. H. M. STANLEY TURNER.

SIR,—I should be grateful if you would allow me to endorse what Drs. E. R. Cullinan and Erich Wittkower said in their admirable articles on ulcerative colitis (*Journal*, December 31, 1938) and to add what I can to the cause of this manifestation of disease, which illustrates better than any other my unitary view of disease. Bacteria play no part in ulcerative colitis and surgical procedure is seldom, if ever, required. Saying that the colitis is associated with and preceded by a psychosis throws no light upon the cause of either condition. All the cases (young individuals) I have had under my care have been only children of parents who were the victims of what I term "inherited disease," and all responded at once to treatment that was aimed at correcting the abnormal chemicophysical changes the protein (particles) in the blood undergo.

I regard as inherited disease the manifestations that are produced by the cells of the tissues and organs failing to get the activity, energy, or nourishment they require from the circulating protein particles which undergo what I call "hydration" *in utero*. When protein particles undergo this chemicophysical change they become independent and use for their own metabolism the activity they should pass on to the cells of the tissues and organs which they bathe. Once disharmony is established between the dynamic and static parts of the body in a family it tends to increase in succeeding generations. Indeed, a family of one child may in itself be a manifestation of inherited disease. Such hydrated particles are vulnerable to invaders during the victim's lifetime, when the manifestations of disease produced may be styled "acquired." All invaders act alike in subjecting inherited hydrated protein particles to dehydration and re-hydration, and the kind of manifestation of disease produced is determined by the degree or grade of re-hydration which is reached by the host's first line of defence.

The salient features in the blood pictures obtained in cases of ulcerative colitis are a lowered sedimentation rate of the red blood corpuscles, refractive index, viscosity, and percentage of the blood urea and protein. When the hydration or re-hydration reaches a high degree the central nervous system is the part of the body which suffers most from being deprived of the activity it requires to enable it to execute its normal functions. The parts of this system to bear the brunt of the attack are the vagal nuclei, presumably because these are the present-day representatives of the oesophageal ganglia, which made their first appearance in the rotifers. The involvement of these areas, which are connected above with the cerebral cortex and below with the intestinal tract and

through the latter with the uro-genital system and integumentary structures of the body, offers an explanation for the association between a psychosis and ulcerative colitis and for further connexion of this syndrome with buccal, genital, cutaneous, and rheumatic lesions. It is possible to trace back the protein in the plasma to the first protein molecules to be generated, but so much more light might be thrown than I am able to do upon the chemico-physical changes the particles undergo to cause disease.

Feeling as I do that no real advance in medicine will be registered until full knowledge is obtained of the chemico-physical properties of the protein in the plasma, I strongly urge those who are doing research work to direct their attention to this medium. I am particularly insistent upon this point at the moment as my most recent investigations indicate that most of the filterable viruses are re-hydrated protein particles. In other words, viruses are of the host's own making, which confirms the view I have been expressing for some time past—namely, that the part micro-organisms play in disease is much smaller than is generally supposed. I stress this point here, since no better manifestation of disease to illustrate it could be adduced than the one which is labelled "ulcerative colitis."—I am, etc.,

London, W.1, Jan. 1. J. E. R. McDONAGH.

Cardiazol for Schizophrenia

SIR,—With regard to the letter by Dr. H. Pullar Strecker in the *Journal* of December 31, 1938 (p. 1390), concerning the dangers of cardiazol treatment, the method of insulin and histamine combined, in which non-toxic doses are used, brings about much the same results as convulsive methods, without fractures, dislocations, fits, or any of these gross accidents. Moreover, the method is useful in long-standing cases. Two cases of schizophrenia under my care, certified, with a history of five or six years each, who were completely asocial and had withdrawn from reality, enjoyed themselves thoroughly this Christmas, joining in with others and finding great amusement in paper hats and other Christmas entertainment.

During the last four years the results of this method have compared very favourably with those of any convulsive method.—I am, etc.,

HORACE HILL.
Salisbury, Jan. 1. Medical Superintendent, Laverstock House.

Social Pathology

SIR,—Mr. Morley Roberts (December 31, 1938, p. 1392) apparently looks on the fall in the birth rate not merely as a sign of national decay but as its cause. In this, I think, he is going too far. Surely mere fertility in the "veterinary" sense will never save a human society. If Mr. Roberts looks deeper he will, I think, find that modern race suicide, so called, is essentially the women's aspect of a growing individual irresponsibility—in fact, of a growing disinclination to take "pains" at all. If statistics were available I rather fancy it would be found that female infertility varies directly with unemployment among men. Both sexes, in fact, are becoming increasingly work-shy, and woman no more wants to labour with child than does the man with his hands or brains.

We all know, of course, that there are many external impediments nowadays—economic, social, etc.—to child-bearing, but I think there is no doubt that the moral factor takes precedence over all. And, further, not only does the modern woman not want to have children but, if they come in spite of her, she increasingly declines to take further responsibility for them. All this is mainly a moral lack, and since woman is essentially organized for child-bearing and child-rearing, whereas man can express himself in a vastly greater number of other ways, the result is that woman, on the whole, is degenerating (and therefore suffering) even more than man. *Corruptio optimi pessima.* All honour to the many noble women who so successfully to-day sublimate their reproductive and family-making instincts; the rank and file, however, are doing nothing of the kind.

Allow me a final word. I believe all this demoralization to be due ultimately to the unnatural subordination of rural to urban life, which makes crowd mentality and the disappearance of individual responsibility inevitable. The present threat to big cities is too widespread a phenomenon to be fortuitous; it exemplifies the nemesis with which Nature in the long run repays persistent infringement of her laws. And one of her principal laws is that all culture which is to endure must be firmly based upon agriculture. Our culture is not so based. If this pathology be correct, then the radical treatment *saute aux yeux.*—I am, etc.,

North Queensferry, Fife, Jan. 1. A. J. BROCK.

SIR,—When Mr. Morley Roberts writes one expects a fresh view of the facts of which he writes, but his remarks on "Social Pathology" are neither new nor demonstrably true. Where others might well doubt, because the grounds are uncertain, he has no difficulty in accepting the view that the birth rate is falling because young girls are not encouraged to become pregnant; he is even sure that "the proper fertile age of women runs roughly from 14 to 28." His readers would like to know the significance of the word "proper" in this connexion. Give the girl a chance of pregnancy as soon as she neglects her dolls, which, says our sage, is while she still feels a vain and empty want of them; but why, wanting them, she neglects them is not mentioned.

Surely the subject to be considered is why some women want babies, have babies, and go on having babies, while other women do not want babies and are very careful not to have them. Contraceptive methods are useful to women of the second class, and when Mr. Roberts avers that birth control is a purely secondary phenomenon he is giving a better example of that figure of speech known as *hysteron proteron* than ever a grammarian gave. What Mr. Roberts says is that the birth rate is falling and that, as a result, many people are practising birth control; but few other people are putting carts before horses. No, to-day there are few women, outside the totalitarian States, who will willingly bear children so that a possible great-grandson may be available to wave the national flag somewhere in a far-flung empire. And we shall not cure that attitude of mind by making young girls pregnant before they are old enough to realize what they are being treated to.

In those countries where the answer to the question "Who made you?" is "God made me" the birth rate does not fall, and there is no need for biologists to suggest reorganization of the decent old-fashioned custom of keeping paedophilia within bounds. Even without child marriage the birth rate of such countries as Ireland remains high; and children are welcomed less as hostages to fortune than as servants of Almighty God. The choice, then, does not lie between "racial death or the collapse of an antiquated moral system." It lies between racial death or the revival of that moral system that has made nations great.—I am, etc.,

London, W.1, Dec. 31, 1938. A. PINEY.

Control of Small-pox in India

SIR,—In reply to Dr. A. G. Newell (*Journal*, December 31, 1938, p. 1392), may I repeat that I do not dispute the value of vaccination in protecting the individual, though Dr. Newell is certainly mistaken when he states that "in any community the deaths from small-pox were limited to the unvaccinated." All that can be claimed is that the case mortality is much greater among the unvaccinated. But with over 4,000 deaths in one year in one city (Calcutta), and over 46,000 deaths in one province (Bengal), surely I am justified in saying that vaccination has failed to protect the community. Obviously the authorities have found it impracticable to vaccinate and re-vaccinate the community sufficiently (and this in spite of an immense amount of vaccination which has been done) to give effective protection.

Dr. Newell admits that inoculation, when practised in Britain, "spread the disease." Exactly! That is just where inoculation would have the advantage (in a country like India) over vaccination, which is not infectious. Provided that the minor variety of small-pox could be persuaded to establish itself in India (and who can say in advance that this would be impossible?), it is quite conceivable that it would continue to do its beneficent work without further assistance. I am assuming that variola minor protects against variola major, and there are good grounds for believing this. Of course there would be practical difficulties to be overcome, but in view of the admittedly appalling mortality from small-pox still persisting in India after half a century or more of intensive vaccination surely it is worth while considering some alternative method.—I am, etc.,

Leicester, Dec. 31, 1938. C. KILLICK MILLARD.

*** This correspondence is now closed.—ED., *B.M.J.*

Sulphonamide for Appendicitis

SIR,—A correspondent has stated that an author of some papers upon sulphonamide chemotherapy "emphasizes the need for waiting for immunity to develop before therapy is begun in gonococcal infections, does not advocate such delay in streptococcal infections of the hand, and ignores the fact in other infections." Although a certain disulphonamide compound has long been known to have more immediate effect in chronic gonorrhoea than in the recent acute infection, we should not brush aside a great volume of sound work that has been done upon other compounds of the group and should not imagine that there is, to-day, any more excuse for withholding some sulphonamide drug from a case of streptococcal appendicitis than from a case of a streptococcal infection of the hand. The leucocyte count will already have provided evidence "to taste" in respect of awakened immunity response. The wisdom of employing sulphonamide in all cases of appendicitis—if only since we cannot at once know which are, even in part, infections by streptococci—can hardly be disputed. Many, including ourselves, have noted satisfactory results.—We are, etc.,

E. M. VOIGT.
C. VOIGT.

Broken Hill, N. Rhodesia, Dec. 15, 1938.

As from January 1, seven different Scandinavian medical journals, representative of the four Scandinavian countries, will appear as a single weekly publication with the title *Nordisk Medisin*. The initiative in this fusion was taken by the Scandinavian weekly *Nordisk Medicinsk Tidskrift*.

Medico-Legal

A COFFIN IN COLLISION

Few branches of law show the progressive influence of medical ideas more clearly than that which deals with remedies for mental or nervous damage. Fifty years ago, steeped in the materialism of that age, the courts did not believe that there really was such a thing. The Judicial Committee of the Privy Council decided in Victorian Railway Commissioners *v.* Coultas (1888) that damages for nervous shock or mental injury were too remote and could not be recovered. That decision, however, has been repeatedly disapproved, and it was settled law by the beginning of the century that if a person suffered in health through having been put in terror of his life, or through a false alarm wilfully given, or through unlawful threats, he might recover compensation. It is not necessary that the shock shall be caused by fear of injury to oneself. In Hambrook *v.* Stokes Brothers (1925) a mother received a nervous shock through seeing a lorry rushing out of control down a hill on which she had just left her children playing. The Lords Justices who heard the appeal in that case differed on the possible extension of the remedy in other circumstances—for instance, whether a bystander who has no personal connexion with the threatened person can recover damages for nervous shock caused by the sight of that person's danger.

The Liverpool Case

Until recently the injury in the reported cases had always been caused by apprehension of injury to a human being. Judge Harrison, sitting in the Liverpool Court of Passage in January of last year,* heard a claim for damages by some members of a family who were driving to the funeral of one of their relatives. A tramcar, negligently driven, collided with the hearse, broke one of the glass side panels, and overturned the coffin so that it was nearly flung into the road. The uncle of the deceased actually saw the tramcar hit the hearse; the aged mother, a female cousin, and her husband saw the effects of the collision. They sued the corporation for damages for shock. They alleged that they witnessed and were horrified at the accident; that the aged mother had suffered from severe shock and collapse, and that the other three had suffered from severe shock. The judge found that each of them had received injury in the nature of shock to a varying degree from the actual sight of damage to a hearse containing the body of a near relative. In case of appeal he assessed the damages at £75 for the mother, £15 for the uncle, £100 for the cousin, and £11 for the cousin's husband. He did not, however, give judgment for the complainants, because in his view of the law a person could only recover damages if he had apprehended or had actually seen injury to a human being.

Judgment of Court of Appeal

The Court of Appeal, in a reserved judgment delivered by Lord Justice MacKinnon on December 12, reversed His Honour's decision. Their Lordships thought that, on principle, the right to recover damages for mental shock caused by negligence is not limited to cases where shock is caused by apprehension for human safety. In their view mental or nervous shock is just as much damage to the sufferer as is a broken limb—"less obvious to the layman but nowadays equally ascertainable by the physician." Their Lordships betrayed a certain scepticism concerning the injuries that the plaintiffs had actually received, but they considered that, although the Court of Passage is not a county court, they should accept the judge's findings of fact. Unfortunately the report does not indicate the evidence on which these findings were based. The Lord Justices recalled Mr. Justice Phillimore's

* Owens *v.* Liverpool Corporation, 1938, 4 All E.R., 727.

description in Dulieu *v.* White (1901) of "the experienced and cool citizen, the ideal *vir constans* for whom *ἐμπειρία* makes *ἀνδρεία*." A man of that polyglot character, they said, might readily be disbelieved if he alleged that such an incident as this had caused him the form of ill-health which is known as shock. The present plaintiffs might well have been disbelieved in that assertion, but the deputy judge had believed them. It might be that the plaintiffs were of that class which is peculiarly susceptible to the luxury of woe at a funeral, and might be disastrously disturbed by any accident to the trappings of mourning. Nevertheless, they said, one who is guilty of negligence to another must put up with idiosyncrasies of his victim that increase the likelihood or extent of the damage. They allowed the corporation to appeal to the House of Lords on condition that it paid the costs in any event.

In Dulieu's Case Mr. Justice Kennedy indicated that no action would lie for merely mental suffering such as fear, unaccompanied by some physical though intangible lesion. The learned Lords Justices seem to disagree, and to recognize mental suffering by itself as a sufficient cause of action. Their remark that nervous shock is as ascertainable by the physician as is a broken limb may cause some surprise to those who have heard medical witnesses contradict each other in traumatic neurasthenia cases.

DAMAGES FOR A SURGEON'S FINGER

Mr. G. Seccombe Hett, a London aurist, recovered substantial damages in an action for negligence against the proprietress of a hotel in Ross-shire. In evidence before the Court of Session in Edinburgh he said that when he was staying in the hotel in May, 1937, he hired a motor-car driven by the brother of the proprietress. Mr. Hett was assisting his wife to alight and, in order to support her, placed his right hand on the centre pillar of the front door. The driver slammed the door on the nail of his middle finger and severed part of the bone. He claimed £2,000 damages. The short report in the *Times* of December 15, 1938, does not state that liability for the acts of the driver was disputed. Lord Keith said in his judgment that the driver should have looked before he shut the door to see that the plaintiff's hand was not in danger, and his failure to do so amounted to negligence. The evidence showed that Mr. Hett was 60 years old and admitted his intention to retire before 70. His income would be affected through inability to undertake some of the more difficult throat operations, and he would have to employ an assistant more than he had in the past, but there was no evidence of how much earning power he had lost. He had suffered a permanent disfigurement and a loss of sensitiveness in the tip of his finger and was handicapped to some extent in carrying out operations, particularly on tonsils. The learned judge awarded £750 damages.

A DOCTOR'S WATER RATE

Part of the strength of this country lies in the readiness of its citizens to resist, like John Hampden, what they consider unjust demands by a public authority. The Hull Corporation sent to Dr. E. F. Yuille a bill for 16s. 6d. for water consumed in the course of his practice, assessed at the rate charged for a trade or business use. He declined to pay, on the ground that he had been using the water for a domestic purpose. He admitted that he had used some in his surgery for diluting medicines for dispensing.

The corporation, regarding the matter as one of principle, sued him in the county court before Judge Sir Reginald Mitchell Banks, K.C. Mr. J. Boyle, solicitor, representing the Hull Corporation, quoted the Hull Corporation Acts, which provide that a supply of water for domestic purposes shall not include a supply of water for any trade or business whatsoever. He claimed that water had been consumed for other than domestic purposes, and submitted that the corporation was entitled to charge at the same rate as it charged to chemists and druggists. Mr. N. G. Black, for the London and Counties Medical Protection Society, cited the ruling of Lord Justice Buckley in Metropolitan Water Board *v.* Avery, that the court must look at the purpose for which the water was used and not at the character of the premises. The dilution of medicine, he said, is in its nature domestic; it is done in every home in the country, and if the corporation is right, then everyone who mixes a gargle uses water for the purposes of a trade or business.

The learned judge reserved judgment, and in delivering it on November 25 he said that he had come with some hesitation to the conclusion that the use of the water was domestic. He felt himself bound by the words of Buckley, L.J., that if the water was used for domestic purposes the use was still domestic even though the demand might be increased by the existence of a trade. He gave as an instance the need for a doctor to wash his hands six times where others wash theirs once, and declared that washing hands, whether it is done by a judge, a doctor, or Pontius Pilate, is in its nature a domestic operation. He distinguished use by a chemist, who makes up medicines for all and sundry who go to his shop, from use by a doctor, who only puts water in such medicine as he recommends his patients to consume. He therefore dismissed the action with costs.

What is Domestic Use?

The proposition brought forward in this case, that if a use can be domestic it is domestic in all circumstances, seems capable of extension to cover some strange possibilities. Moreover, the judge seems to have been on dubious ground in saying that Pontius Pilate's washing of his hands was a domestic operation. On the contrary, it was performed solemnly, *in banco*, and was almost certainly one of the dramatic ritual acts in which Roman legal procedure was so rich. We understand that the corporation intends to appeal, and therefore in due course we may expect to hear the views of three Lords Justices on a question which concerns thousands of doctors and also presumably, indirectly, of veterinary surgeons and possibly of unqualified practitioners as well. The dentists are lucky in already possessing Manchester Corporation *v.* Buttle, which seems to indemnify them.

Corrigendum

In the article published in this column last week headed "'Care and Treatment' under Herbert's Act" there was a misprint. The phrase "mental home" in the fourth line of the second paragraph of column one, page 1396, should have been "*marital* home."

The principal work of ULAWS (University of London Animal Welfare Society), whose annual report has just been published, has been to lead university students, who will be leaders of thought in the future, to interest themselves in the protection of animals. It has also encouraged technical experts to bring their special knowledge to bear upon problems of man's relation to animals. The report announces an important development—the formation of UFAW (the Universities' Federation for Animal Welfare). This national organization is recruiting members from all the British universities, and the scope of the work previously located in the University of London is thus being greatly extended. This development has already received a satisfactory response in the older universities. During the past year substantial progress has been made in the society's Parliamentary programme in connexion with the gin trap, and a scientific investigations committee has been formed for the purpose of elucidating technical problems bearing upon the welfare of animals.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following have satisfied the examiners in the third examination for medical and surgical degrees:

Part II (Principles and Practice of Physic, Pathology, and Pharmacology): H. St. C. C. Addis, J. Arnott, G. Bourne, B. R. Bray, E. B. Brennan, J. Clutton-Brock, P. C. Conran, C. H. C. Dent, E. S. Dismorr, A. R. P. Ellis, G. H. Evans, R. G. D. Forward, G. A. Fowler, E. K. Gardner, W. R. Gavin, C. W. C. Gough, M. H. Harmer, C. H. Hoskyn, T. B. Hutton, J. D. H. Iles, R. D. S. Jack, H. M. James, E. P. Jowett, A. Leese, B. E. Miles, M. E. Moore, G. F. Panton, H. G. Percy, J. S. Phillpotts, G. C. Pritchard, D. L. Ridout, G. S. Robinson, C. J. Rooke, D. Russell-Davis, E. W. Somerville, R. C. Southern, D. C. Sturdy, P. Unwin, J. D. Wade, D. O. Walker, J. Watson, J. M. Wilkin, R. H. Winfield, R. L. Witney, B. M. Wright. *Women:* E. F. Graham-Kerr, J. M. E. Hannaford, I. T. Hinde, M. Lloyd, V. L. Lutwyche.

The names of successful candidates in Part I (Surgery, Midwifery and Gynaecology) were printed last week at page 1397.

UNIVERSITY OF LONDON

The following candidates have been approved at the examinations indicated:

M.S.—*Branch I (Surgery):* E. W. Bintcliffe, J. A. Currie, A. J. C. Latchmore. *Branch III (Ophthalmology):* H. W. Applin.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE

The following candidates have been approved at the examination indicated:

ACADEMIC POSTGRADUATE DIPLOMA IN PUBLIC HEALTH.—*Part I:* T. K. Abbott, Lily Bennett, Margaret Brodigan, H. B. C. Carter-Locke, J. Clark, Eva M. Cran, M. Daniels, C. S. Davies, D. O. Dickie, Jean Duncan Whyte, R. W. Elliott, C. N. Faith, Margaret A. B. Fleming, Christina A. Gunn, E. C. H. Huddy, J. H. Lawrence, H. A. Leggett, V. N. Leyshon, F. D. M. Livingstone, Jean J. Macdonald, J. P. McGladdery, R. W. Markham, Isobel M. S. Marshall, E. L. M. Millar, A. Mukerji, Dorothea M. Norman-Jones, M. N. Pai, J. W. Parks, P. Pau, G. H. Shaw, M. M. Sircar, G. R. Taylor, C. S. Thomson, N. V. Williams, R. C. Wofinden, Grace E. Woods, Rowena Woolf.

UNIVERSITY OF LEEDS

The following candidates have been approved at the examinations indicated:

FINAL M.B., CH.B.—*Part I:* A. N. T. Aikman, T. Akroyd, J. B. Ashmore, C. E. Astley, P. D. Bedford, C. H. Boyd, A. Colbert, J. B. Coltman, E. Cope, F. Debney, R. G. Denniss, Patricia M. Dobinson, J. M. Fitton, M. M. Frais, M. Goldberg, H. Goldstone, Mary E. Goodson, F. Goldsborough, A. Green, A. Greenwood, G. Higgins, J. Hirst, H. J. M. Holland, Adelaide J. G. James, F. Jennings, R. E. Johnson, Jean Middlemiss, D. E. Mitchell, L. H. Moss, A. Percival, C. Pickard, I. G. W. Pickering, J. D. Pickup, T. B. Purdy, P. Rapaport, G. N. Reed, L. Rosenthal, F. Sandy, J. F. Scannell, J. V. Schofield, Helen M. Secker, W. Sheffield, F. N. Shuttleworth, I. Mary Shuttleworth, S. A. Swanson, E. S. Tan, P. E. R. Tattersall, A. L. Taylor, P. J. Waddington, R. P. Warin, K. D. Wood, I. Young.

D.P.H.—Mary W. Taylor.

QUEEN'S UNIVERSITY, BELFAST

The following candidates have been approved at the examinations indicated:

M.D.—J. G. Pyper (with Gold Medal), J. R. Armstrong (*in absentia*), W. J. Lascelles, J. H. Moffett, B. O. Moore, Mary E. Nevin.

M.B., B.CH., B.A.O.—N. S. Barnett, Eileen M. Bowe, J. McL. Bowman, T. A. Brady, H. Brewster, G. Burns, G. Byrne, J. S. Campbell, D. E. Christie, A. Clint, W. S. Cowan, C. A. Craig, Mary E. Dunn, G. I. Fenton, Muriel Gault, G. Gregg, T. P. Gunn, T. H. Hamilton, Mary McK. Hanna, Martha A. Hay, R. N. Hetherington, J. C. Hewitt, J. K. Houston, H. H. Kelso, I. M. Librach, J. L. Love, M. J. Martin, J. M. B. Morwood, A. J. O'Friel, R. T. Smith, Janet G. Weir, N. A. Williamson, G. O'N. Wynne.

NATIONAL UNIVERSITY OF IRELAND

UNIVERSITY COLLEGE, CORK

The following candidates have been approved at the examinations indicated:

M.D.—J. B. O'Regan, W. O'Sullivan.

M.CH.—J. G. Barrett.

M.B., B.CH., B.A.O.—*E. J. Cantillon, †W. Cranley, †J. A. Seavers, †J. J. McGrath, T. J. Bird, J. W. Byrne, F. C. Devlin, F. J. Laycock, W. F. Lenahan, J. A. McCarthy, J. P. Mulligan, J. P. Nolan, M. O'Brien, A. O'Connor, H. A. O'Grady, D. O'Keeffe, P. J. O'Reilly, H. J. J. O'Sullivan, W. N. Philpot, S. Rosehill, D. R. Tully. *Part I:* D. J. K. McCarthy. *Part II:* M. A. Carroll, M. G. O'Mahony, J. V. O'Sullivan, P. J. O'Sullivan. *Exempt in Pathology:* M. A. Carroll, M. S. Murphy, J. O'Regan. *Exempt in Midwifery and Surgery:* T. J. O'Connor.

DIPLOMA IN PSYCHOLOGICAL MEDICINE.—M. J. Kennefick.

D.P.H.—J. O'Sullivan.

* With first-class honours. † With second-class honours.

Medical Notes in Parliament

Drug Traffic in Far East

On the motion for the Christmas adjournment on December 22, Commander FLETCHER raised matters arising out of the work of the Advisory Committee on Drugs at Geneva. Year after year statements at Geneva showed the Japanese Government had not displayed good will in this matter. The British delegate at Geneva said the situation constituted a menace to the rest of the world. A resolution had been passed reiterating that the situation in China was degenerating under Japanese influence and calling on the Governments concerned to take vigorous action to remedy the situation in the Far East. The Japanese Government was charged with fostering trade in morphine, heroin, and opium, not merely for consumption in China but for export all over the world, including the Dominion of Canada. The Government of Hong Kong could not cope with the traffic, and there were 40,000 opium addicts there. The Japanese Government also failed to penalize Japanese smuggling of cocaine into India. Drug-taking in Japan itself was suppressed by rigorous laws. In China every town taken by the Japanese became an open market for drugs. The Central Japanese Opium Companies had opened chain agencies throughout the country. Chinese workers had been forced to receive part of their wages in opium.

Mr. BUTLER said the Government viewed with grave concern the drug situation as reviewed by the League of Nations last autumn. One serious feature was the growth in the use of heroin, which was getting a greater hold on the youth in the Far East. The British Government was in communication with other Governments, and not only with those Governments which were members of the League. Under the Anglo-Japanese Drug Traffic Agreement British consular and diplomatic officers had in the past autumn been instructed to co-operate with the appropriate Japanese authorities by mutually communicating information regarding the proceedings and movements of persons known to be engaged in the illicit drug trade. This co-operation had just been put into motion, and through it the British Government would make clear the gravity it attached to the matter. His information was that in Peking since the formal repeal there of the ordinances of the Chinese Central Government on opium and narcotics, promulgated in 1935, innumerable drug shops were opened until scarcely a street was without one or more. It was recently reported that new ordinances aimed at control of the narcotic trade had been issued in Manchukuo, but it was too early to say how they would operate. The position in Central China did not seem so serious. The increase in the traffic in heroin chiefly emanated from Tientsin. Korean pedlars of this drug followed the Japanese armies, but Lord Halifax had no information on the attitude of the Japanese military authorities to the trade.

The House adjourned till January 31.

A.R.P. First-aid Services.—In an approved strength of 140,000 men for first-aid services in association with air raid precautions, 120,876 men have been recruited. The approved strength of women for the same services is 220,000, and 222,190 have been recruited. For rescue and decontamination parties 100,000 men are the approved strength, and 113,800 have been recruited.

Obituary

T. WINGATE TODD, F.R.C.S.

Professor of Anatomy, Western Reserve University

Professor T. Wingate Todd, an outstanding figure among modern anatomists, died in Cleveland, Ohio, at the age of 53, at the close of 1938. During the past twenty-six years he has filled the chair of anatomy in Western Reserve University, Ohio, and built up there a school which has become famous as a centre of teaching and research for all the world. Born in Sheffield in 1885, of Scottish extraction, he was educated at Manchester University, taking his medical degree with first-class honours in 1907, and filling the usual house-posts in the Infirmary. He took his F.R.C.S.Eng. in 1911. Bred in anatomy under the late Professor Young, he had become lecturer in anatomy when the late Sir Grafton Elliot Smith was appointed to succeed Professor Young in 1909. His researches were at first devoted to the histology of developing and growing bone, the occurrence of cervical ribs and their pressure effects, particularly on vasomotor nerves passing into the upper limb. His paper in the *Journal of Anatomy* (1913, **47**, 250) on "The Arterial Lesion in Cases of Cervical Rib" must have been among the first, if not the first, to call attention to the arterial changes which follow pressure on sympathetic nerve supply.

In 1912 he was invited to fill the chair of anatomy in the Western Reserve University, his colleague in the chair of physiology being another British subject, the late Professor J. J. R. Macleod. He set to work, and in a few years built up such a department as is to be found in no other university. He realized that if our knowledge of the changes which the human skeleton undergoes according to age, sex, and race was to be placed on a scientific basis, then collections must be made of skeletons of which the sex, race, and age of every one was known. In 1912 our knowledge was based on collections in which the sex, age, and race were "inferred"—often wrongly. By 1933 he had assembled 3,407 human skeletons, all with well-ascertained racial and social histories. His enthusiasm, his enterprise, and his public spirit brought him the needed financial support and an army of willing research assistants. Perhaps his greatest contribution to knowledge was his demonstration that from infancy to old age the human skeleton was undergoing a succession of changes, and by recognition of this succession it was possible to assess the approximate age of any given skeleton. Nor did we know the physical changes which the bones and skulls undergo after death, when they are macerated and dried, until he supplied the needed data. He and his pupils contributed year after year to the *American Journal of Physical Anthropology*, to the *American Journal of Anatomy*, to the *Anatomical Record*, and to our own *Journal of Anatomy* papers dealing with problems relating to sex, age, and race characters. His aim was to provide a sure basis on which students of the human body might build. Another field of inquiry was the motility of the alimentary tract—especially disturbances in rhythm and vigour produced by mental states. He began by making systematic *x*-ray examinations of his students. The chief results of his investigations were given in 1930, as the Beaumont Lectures, published under the title *Behaviour Patterns of the Alimentary Tract*.

Wingate Todd's greatest undertaking lies in the last decade of his life. Until he began his investigations our knowledge relating to the growth of the human body—from birth to maturity—was based on the measurement of stature and of weight. He resolved to measure the bone changes as revealed by *x* rays. With this end in view he made examinations of the children of well-to-do and healthy parents, four times a year, through the whole of their growing periods. His aim was to obtain a standard series of observations which would serve the needs of medical men, especially medical officers of schools. Through the Brush Foundation—of which he was the leading spirit—he organized a systematic and continued examination of 800 children. When the White House Conference was assembled in 1932 his data and methods provided a basis for the programme of investigation which was adopted. The firstfruits of this great endeavour—the systematic investigation of growth changes in children—appeared in 1937. This formed the first volume of his *Atlas of Skeletal Maturation*, with seventy-five plates which give standard examples of the stages in ossification which the hand passes through from birth to maturity. Subsequent volumes were planned for other parts of the body. Another field of investigation was the growth of the face and the bearing of such a knowledge on the practice of the dental surgeon. He measured the deformities in facial growth which result from deficiency of thyroid. Indeed, at the time of death he and his son had launched out on a wide comparative field, in which the order of epiphysial union in mammals—particularly in those related to man—was noted and contrasted with the order of union which he had observed in human skeletons. For this purpose he assembled in his department a multitude of animal as well as of human skeletons.

He ran the engine of his body and of his mind with the throttle open to its utmost limit. Perhaps there has been no one since John Hunter built up his museum who has had so ardent and so insatiable an ambition to amass material and accumulate knowledge as had Wingate Todd. When the "slump" descended on America in 1929, Professor Todd's department, which had grown to such dimensions under his industry, enterprise, and enthusiasm, was hit very hard. He had to go out and raise funds to keep his staff and collections alive. Friends rallied to him, but the burden he had shouldered was more than even a giant in strength could have carried. A man who plans so far ahead, one who begins a programme that requires a lifetime to bring to maturity, has to wait long for recognition. It is only now that Professor Todd's greatness is becoming apparent, only now when death has taken him away. It will be just as difficult for America to find a fit successor for him as it was for England to find another John Hunter.

There were some who hoped to see Wingate Todd again within the British fold, filling an English chair. He had dug himself too deeply in to be moved. He retained his British nationality in spite of many temptations to lay it aside; he hoped to die under the Union Jack. So recently as in the past year his colleagues in England wished to see him a Fellow of the Royal Society, and prepared a certificate of his claims.

A. K.

J. M. writes:

The news of the sudden death of Wingate Todd at the early age of 53 comes as a great shock to his many friends in the country of his birth. Although he emigrated when only 28 to Cleveland, Ohio, to take the chair of anatomy in the Western Reserve University and remained there for the rest of his days, his early achievements in Manchester as a lecturer in anatomy were remarkable. The last illness of Professor A. H. Young threw a heavy

responsibility on Todd soon after he joined the anatomy staff at Manchester University and gave him an early opportunity to develop his outstanding capacity for administration. When Young was succeeded in the chair by Elliot Smith, Todd found in his new chief a man who could appreciate his great gifts and who encouraged his subordinates to enter the most fertile fields of research. Todd's work on the morphology of the brachial plexus and the symptomatology of cervical rib was all carried out in this short period, and marked him out as an investigator who combined great industry with a clear vision of the aid that anatomy could bring to clinical knowledge. After his migration to America his researches became more concerned with osteology, and seemed to many of his clinical friends to be of less practical utility than his earlier work; but he founded a great department in Cleveland and exerted an influence on the teaching of anatomy in the United States that will long be felt.

But it is of Todd as a man rather than of his output that one thinks now. The son of a Methodist minister, he had a kind of evangelical fervour that pervaded all his doings and never allowed him to give less than his best. Great physical and mental energy, and a capacity possessed by many of his Scottish blood to do with very little sleep, enabled him to live at a pressure denied to lesser men. Yet with his immense capacity for driving himself there was nothing of the egotist about him. He was untiring in helping his colleagues and students. His interests were wide, ranging over literature, archaeology, and art as well as his own subject; but he carried his encyclopaedic knowledge with a modesty that endeared him to all who knew him. He was supremely happy in his family life, and the sympathy of his many friends and admirers in this country will go out in fullest measure to his widow and sons in their loss.

G. J. writes:

By the untimely death of Wingate Todd British anatomy must have lost one of its most distinguished protagonists. The changing fashions of anatomy during the last decade may have made his achievements seem less important than they actually were. But to have worked with him was an experience not easily forgotten. He was quite tireless, his mind so teeming with ideas that it early appeared one life would be too short a time for him to encompass all that he wished. He would appear in his early days in the anatomy department at Manchester soon after 8 a.m. and would be found there till midnight, giving time grudgingly for meals. He was the embodiment of transatlantic hustle, and there was small wonder when he was so soon transported to the United States, where his ceaseless energy outdid even their own. It might be thought that Todd was an uncomfortable man to work with; this was not so. He had a keen sense of humour, and though he never suffered fools gladly he never wounded the feelings of the less intelligent. He set an example in diligence which he hoped others might copy, but if they could not he did not bully them.

The writer was associated with him both as a hospital resident and later in the anatomy department under Elliot Smith, whose lecturer he was. Though trained in the classically pure school of anatomy of Elliot Smith's predecessor, A. H. Young, Todd was instantaneously captured by the breadth of vision of the new mind, and applied himself at once to the new turn to anatomical thought and teaching that Elliot Smith inspired. Both his teachers made their mark on Wingate Todd, as is evidenced by his early studies on fixation of the brachial plexus, the course of the sympathetic fibres in it, and his studies on the first rib (work which time has emended but little), but much more clearly in the immense osteological collection which was his pride at Cleveland. This was the first great fully documented collection, where the history and often the habits of the previous wearers of the skeletons were known. Parallel with the formation of this collection he became absorbed in problems of growth, the growth of the child in particular, a study no doubt suggested by his anthropological leanings. What he would have done with the remaining part of his life we shall not know. But a brain so full of all manner of things could never have come to a standstill. Much as he loved his American friends and colleagues, he was intensely proud of his own nationality.

E. W. GOODALL, O.B.E., M.D.

Late Medical Superintendent, North-Western Fever Hospital, London

Edward Wilberforce Goodall, who died on December 29, 1938, at the age of 78, in a London nursing home after a short illness, had a well-deserved reputation, both in this country and abroad, for his work in connexion with infectious diseases.

He had a distinguished career as a student at Guy's, gaining honours in anatomy at the intermediate M.B.Lond. in 1883 and proceeding in 1885 to the final M.B., at which he was awarded the gold medal and scholarship in forensic medicine. In the following year he took the M.D. and in 1888 the B.S. with honours. After working in resident posts he was appointed medical registrar at Guy's, and while holding this appointment and without any previous fever service he was appointed by the Metropolitan Asylums Board to be medical superintendent of the Eastern Hospital at Homerton. Some years later he was transferred to the North-Western Hospital at Hampstead, where he remained until he retired in 1926. Thus during practically the whole of his professional life Dr. Goodall devoted himself exclusively to infectious diseases. Countless numbers of students passed through his hands at the two special hospitals where he was superintendent. He also taught his subject at the R.A.M. College at Millbank.

Goodall was a born clinician. The search for the truth became the ruling passion of his professional life, and he spared himself no pains in getting to the bottom of a difficult case. His vast experience made his opinion almost unrivalled, and the passing of the years did nothing to dim the brilliance of his intellect. As a teacher he was deservedly popular. His enthusiasm made a direct appeal to his students and his obvious desire to give them a practical working knowledge of the subject left an indelible impression. "He taught me fevers" was not less a compliment than a statement of fact which one has often heard said of Goodall by practitioners of greatly different ages. With Dr. Washburn he wrote the well-known *Textbook of Infectious Diseases*, which went into three editions, the last one being largely rewritten and edited by Goodall in 1928, after his colleague's death. In 1934 he wrote a *Short History of Epidemic Infectious Diseases* and several other pamphlets on the historical side of epidemiology. At the Royal Society of Medicine he took an active part in the Epidemiological Section and in the Section of the History of Medicine, of both of which he was elected president. For many years he was a member of the Hampstead Medical Society, of which he was subsequently elected to honorary membership. He was also an Honorary Fellow of the Society of Medical Officers of Health.

In the affairs of the British Medical Association, of which he became a member in 1892, Goodall always took a prominent part. In every Division of which he was a member he was a tower of strength and seldom missed a meeting. He was at one time honorary secretary and subsequently president of the Metropolitan Counties Branch. In this connexion he did great work with Sir James Smith Whitaker in reorganizing the Branch and putting their scheme into operation. He was a member of the Council from 1910 to 1912 and representative at the Annual Representative Meeting on numerous occasions. His central activities were largely concerned with the question of medical inspection and treatment of school children. At the London Meeting of the Association in 1910 he was an honorary local secretary, and at Birmingham in 1911 vice-president of the Section of State Medicine and Industrial Diseases. He was also for many years a member of the General Nursing Council. During the war he was given charge of the Grove Military Hospital at Tooting with the rank of lieutenant-colonel, and for these services he was awarded the O.B.E.

After his retirement he went to live at Hemingford Abbots, near St. Ives, and became a member of the Cambridge and Huntingdon Division of the B.M.A., being elected chairman from 1929 to 1931. In 1931 he returned to live in Hampstead, and again associated himself with the Hampstead Division, of which he became chairman in 1933–4. He finally returned to Hemingford Abbots in 1936, and lived there up to the time of his last illness. Like many town dwellers, he was passionately fond of the country. Fishing was his favourite sport, and he would talk with enthusiasm of holidays spent in tramping the desolate region of Snowdonia. To some extent his love of the country compensated him for his enforced retirement from active practice, but even in retirement he kept in touch with the profession through the journals, to the correspondence columns of which he was a frequent contributor, and through his membership of the Association, which he retained to the last.

ERNEST MALVOZ, M.D.

Professor Ernest Malvoz, who died at the end of 1938, was one of Belgium's greatest pioneers in public health. He was born in 1862, and while still quite a young man he contributed important research on the transmission of bacteria from the mother to the foetus. For this work he was awarded a travelling scholarship, and for some time he studied in Germany and France. On his return to the University of Liége he was appointed professor of bacteriology. In 1894 he introduced into Belgium the serum treatment of diphtheria which had originated with Roux. Malvoz was put in charge of the first bacteriological institute established in Belgium, and he included in the activities of this institute disinfection and water analysis services. In 1897 he helped to found the first Belgian public sanatorium, and soon afterwards he was busy with Calmette in anti-tuberculosis work on bacteriological and public health lines. They agreed as to the transcendent importance of the dispensary in the campaign against tuberculosis, and it was in 1900 that the first Belgian anti-tuberculosis dispensary was opened at Liége under the direction of Malvoz. In 1903 he turned his attention to ankylostomiasis, very rife among Belgian miners at that time. Indeed, approximately one out of every three miners suffered from this disease, which, thanks in large part to his influence, was completely eradicated in the neighbourhood by 1912. Malvoz did much to combat miners' nystagmus also, and in 1912 he founded the first anti-venereal disease dispensary. In 1924 he instituted a centre for the preparation and distribution of the BCG vaccine. In a commemorative address at a recent meeting of the French Academy of Medicine Dr. Guérin coupled the names of Calmette and Malvoz, friends and co-workers whose dissimilar temperaments made them all the more effective as a team: Calmette the wise and prudent, Malvoz the sparkling enthusiast, magnetic and inspiring.

Sir ALFRED HENRY EVANS died at the age of 91 at Sutton Coldfield, Warwickshire, where he had been prominent in public life for sixty years. He was related to George Eliot (Mary Ann Evans), who was his father's half-sister; and his grandfather, Robert Evans, a land agent, was the prototype of Adam Bede. Alfred Evans studied medicine at Guy's Hospital and qualified as M.R.C.S. and L.S.A. in 1870, and immediately afterwards started in general practice at Sutton Coldfield. He soon took an active interest in local public affairs, and was elected a member of the first Town Council. He served as alderman and deputy mayor, and in 1890 became mayor. Sir Alfred Evans was a borough magistrate at Sutton Coldfield, a member of the Grammar School Governors, chairman for many years of the municipal trustees, and prominently associated with local charitable institutions. He had been chairman of the Tamworth Division Unionist Association, and held many offices in Freemasonry. He was knighted in 1926 in recognition of political and public services, and in 1931 the honorary Freedom of Sutton Coldfield was conferred on him. He was a past-president of the Midland Medical Society, and belonged to the British Medical Association up to the time of the first National Health Insurance Act. He married in 1879 a daughter of Sir Frederick Howard; she died in 1885, leaving a son and a daughter.

The death took place at his residence in Glenluce, Wigtownshire, on December 17, of Dr. DAVID MATTHEWS, the oldest practitioner in the south-west of Scotland. Born at Carluke in 1856, Dr. Matthews was educated at Glasgow High School and afterwards at the University of Edinburgh, where he graduated B.Sc. and M.B., C.M. in 1880. Shortly afterwards he took up practice in Wigtownshire, where he carried on for fifty-six years. He took a prominent part in local public work, being for many years a member of the School Board, and having twenty-six years of service on the Wigtownshire County Council. He was medical officer for the parishes of Old Luce and New Luce, and was very popular with his many patients.

The following well-known foreign medical men have recently died: Dr. RAYMOND DURAND-FARDEL, corresponding member of the Académie de Médecine and officer of the Legion of Honour, aged 85; and Dr. EDWIN STROSCHEIN, an eminent ophthalmologist of Dresden, aged 78.

A profusely illustrated report records the proceedings of a conference held at Balliol College, Oxford, in July, 1938, under the auspices of the Cremation Society and the Federation of British Cremation Authorities. Lord Horder, who presided over the conference, argued cogently in favour of cremation. He stressed the importance of the system of certification, which, in his opinion, provided a means both for the prevention and for the detection of crime. Among other practical points Lord Horder drew attention to the waste of land which, occupied by cemeteries, is withheld from economic use, and to the prospect of further alienation of land in the course of cemetery extensions in the future. Other speakers dealt with the attitude of the Church towards cremation, the planning of the crematorium, the technique of cremation, and, indeed, every aspect of this method of disposal of the dead.

The Services

DISTINGUISHED SERVICES IN PALESTINE

The name of Group Captain K. Biggs, M.C., R.A.F.M.S., has been brought to notice by the General Officer Commanding the British Forces in Palestine and Trans-Jordan, in recognition of distinguished services rendered in connexion with the operations in Palestine during the period September 12, 1937, to March 31, 1938.

EFFICIENCY DECORATION T.A.

The King has conferred the Efficiency Decoration of the Territorial Army upon Lieutenant-Colonel O. G. Misquith, R.A.M.C., T.A. (retired).

DEATHS IN THE SERVICES

Colonel BERNARD BRUCE BURKE, C.B.E., D.S.O., R.A.M.C. (ret.), died at Worthing on December 11, 1938, aged 62. He was born on January 2, 1876, was educated at Dublin in the school of the Royal College of Surgeons, and took the L.R.C.P. and S. in 1897. After filling the post of assistant resident surgeon at Nottingham General Hospital he entered the Army as lieutenant in the Royal Army Medical Corps on June 21, 1900, became lieutenant-colonel on December 26, 1917, colonel on August 28, 1928, and retired early in 1931. He served throughout the war of 1914–18, and was mentioned in dispatches in the *London Gazette* of October 19, 1914, January 1, 1916, and December 30, 1918. He received the D.S.O. and, after the war, the C.B.E.

Lieutenant-Colonel RICHARD ROSE WEIR, Bengal Medical Service (ret.), died at Richmond, Surrey, on November 27, 1938, aged 83. He was born on February 21, 1855, the son of the Reverend James Weir of Dranie, Elgin, and was educated at Aberdeen University, where he graduated M.B., C.M. in 1880. He entered the Indian Medical Service as surgeon on September 30, 1882, became lieutenant-colonel after twenty years' service, and retired on February 21, 1910. Most of his service was spent in civil employment, his last post being that of Inspector-General of Jails in Eastern Bengal and Assam. He was a younger brother of the late Colonel P. A. Weir, I.M.S.

Medical News

A meeting of the Paddington Medical Society will be held at the Great Western Hotel, Paddington, W., on Tuesday, January 10, at 9 p.m., when Colonel J. M. Weddell will deliver a lecture on "The Surgical Treatment of Air Raid Casualties." Members of the Air Raid Precautions staff of the Ministry of Health will take part in the discussion, and all medical practitioners are invited to attend.

At a public luncheon to be held on Thursday, January 19, at Princes Restaurant, Piccadilly, W.1, at 1 for 1.10 p.m., Dr. J. R. Rees, Medical Director of the Tavistock Clinic, will speak on "The Progress of Medical Psychology." The luncheon is organized by the National Institute of Industrial Psychology, Aldwych House, Aldwych, W.C.2, from whom tickets, price 5s. 6d., exclusive of wines but inclusive of gratuities, may be obtained. A demonstration of psychological methods of vocational guidance will be held at the Institute following the luncheon at 3 p.m. By reason of limitation of space admission will be by ticket, and guests who wish to attend the demonstration are asked to say so when applying for luncheon tickets.

The British Institute of Philosophy announces an address entitled "The Present Relations of Science and Religion," by Professor C. D. Broad, at University College, Gower Street, W.C., on Tuesday, January 17, at 8.15 p.m. Applications for tickets should be made to the Director of Studies at University Hall, Gordon Square, W.C.1.

On the retirement of Lieutenant-Colonel E. D. Caddell, *M.C.*, Dr. J. H. Harley Williams, D.P.H., Medical Commissioner of the National Association for the Prevention of Tuberculosis, has been appointed by the Council as Secretary-General of that body.

Dr. Repond of Monthey, Switzerland, will read a paper on "Psychology and Psychiatry" at a meeting of the Section of Psychiatry of the Royal Society of Medicine (1, Wimpole Street, W.) on Tuesday, January 10, at 8.30 p.m. Members of the medical profession and medical students will be welcomed if introduced by a member.

A meeting of the Pharmaceutical Society of Great Britain will be held at 17, Bloomsbury Square, W.C., on Tuesday, January 10, at 8.30 p.m., when a lecture on "Recent Discoveries about Animal Hormones" will be given by Professor J. H. Gaddum.

Discussions on "Heavy Naphtha Disinfestation" and on "Books and Infection" will be opened by Dr. B. T. J. Glover and Dr. Archibald Dodd respectively at a sessional meeting of the Royal Sanitary Institute at Chester Town Hall on Friday, January 20, at 5 p.m.

Among the subjects to be discussed at a conference on the economic road to peace at Friends House, Euston Road, N.W., from January 26 to 28, is "World Agriculture and the Problem of Nutrition," to be opened by Dr. G. T. Wrench; and Dr. J. Ewart Purves will take part in one of the other discussions. Readers interested should write to the honorary secretaries of the conference at the Dick Sheppard Memorial Club, King's Weigh House, Thomas Street, W.1, for full particulars.

At a meeting of the Illuminating Engineering Society on Tuesday, January 17, at 7 p.m., in the Hall of the Institution of Mechanical Engineers, Storey's Gate, St. James's Park, there will be a general discussion on the fourth report of the Departmental Committee on Lighting in Factories.

An exhibition of pictures and sculpture by medical practitioners will be held from February 12 to March 12 at the Stadthaus, Berlin-Wilmersdorf, Kaiser-Allee 1–12.

Sir Milsom Rees is again offering two £100 scholarships at Port Regis Preparatory School to the sons of medical men. Candidates must be under 9 years of age when the examination is held during the first week in March, 1939. Applications should be addressed to the Headmaster, Port Regis, Broadstairs.

The *Medical Press and Circular* is celebrating its centenary this month. It was founded in January, 1839, in Dublin by Dr. Arthur Jacob under the title of the *Dublin Medical Press*, and in 1866 it absorbed the *Medical Circular*. From the date of the amalgamation the journal has been published in London. A book will be published in connexion with the centenary, and a dinner will be held at Claridge's on January 25.

The Lancashire Mental Hospitals Board has decided to reduce the hours worked by all indoor staffs from fifty-four to forty-eight a week from April 1.

The British Red Cross Society's Clinic for Rheumatism has benefited to the amount of £1,173 from the Red Cross Ball held at Grosvenor House on November 23, 1938.

A chair of endocrinology has been created at the Collège de France by the Minister of Education, with Professor Courrier of Algiers as its first occupant.

Professor Julius de Darányi, M.D., director of the Hygiene Institute of the Royal Hungarian Péter Pázmány University of Budapest, has been appointed president of the Hungarian Postgraduate Medical Education.

The Egyptian Order of the Nile has been conferred on Professors Sauerbruch, G. von Bergmann, and H. Chaoul by the King of Egypt.

During the period 1931 to 1936 the white population of South Africa increased by 9.6 per cent. and the coloured population by 20.3 per cent., so that the proportion of whites in the total population has fallen from 22.5 to 20.9 per cent.

No. 51

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended December 24, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (125 in 1937) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	14	4	8	1	—	27	7	9	3	3		
Deaths		1	—				1	2				
Diphtheria	1,124	112	204	46	27	1,291	149	198	66	45	1,300	186
Deaths	31	3	9	2	1	37	1	7	4	1		
Dysentery	27	12	14		—	270	72	58		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	2	—	—		—	6	—	—		—		
Deaths		2					—					
Enteric (typhoid and paratyphoid) fever	31	2	2	9	1	19	1	7	3	6	2	
Deaths	1	—	—	—	—	4	1	—	—	1		
Erysipelas			67	5	2			81	3	4		
Deaths		1					1					
Infective enteritis or diarrhoea under 2 years												
Deaths	47	15	9	2	—	49	12	3	2	3		
Measles		21	11		—			506		295		
Deaths	2	—	—	1	—	31	1	5	2	6		
Ophthalmia neonatorum	72	4	18		—	67	4	23		—		
Deaths												
Pneumonia, influenzal*	825	100	7	7	10	1,093	149	26	1	10	1,106	142
Deaths (from influenza)	41	1	7	4	3	46	4	15	1	2		
Pneumonia, primary			261	9				377	11			
Deaths		12		16	10		24		18	26		
Polio-encephalitis, acute	2	—				—	—					
Deaths		—										
Poliomyelitis, acute	29	4	1		2	5	—	—		—		
Deaths		—					1					
Puerperal fever	1†	1	10	1	—	1†	1	11		1		
Deaths		—					1‡					
Puerperal pyrexia	119	11	14		1	122	5	16		—		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths												
Scarlet fever	1,402	96	258	43	69	2,244	131	493	62	86	2,267	298
Deaths	3	—	—	—	—	7	1	1	2	1		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		148	335		27			46		5		
Deaths	12	4	8	3	1	18	6	3	—	2		
Deaths (0-1 year)	367	69	95	22	14	431	77	97	16	31		
Infant mortality rate (per 1,000 live births)	61	57				72	64					
Deaths (excluding stillbirths)	5,357	1,000	727	208	172	5,711	1,105	841	182	195		
Annual death rate (per 1,000 persons living)	13.2	12.7	14.8	14.1	15.2	14.1	13.9	17.2	12.4	17.3		
Live births	4,828	799	814	205	193	5,019	1,004	803	197	195		
Annual rate per 1,000 persons living	11.9	10.2	16.6	13.9	17.1	12.4	12.6	16.4	13.4	17.3		
Stillbirths	289	39				268	37					
Rate per 1,000 total births (including stillborn)	56	47				51	36					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Death from puerperal sepsis.

EPIDEMIOLOGICAL NOTES

Acute Poliomyelitis

There was a drop in the notifications of acute poliomyelitis in England and Wales during the week—29, compared with 31—but in London 4 cases were notified, as against none in the previous week. The chief counties affected were: London 4 (Battersea, Kensington, St. Pancras, Wandsworth, 1 each); Berkshire 4 (Easthampstead 4); Essex 2 (Colchester 2); Lincoln 2 (Boston, Louth, 1 each); Nottingham 2 (Carlton 2); Southampton 2 (Bournemouth, Eastleigh, 1 each). Three further cases were notified at Wellington College during the week ended December 31, bringing the total up to 5 at the time of going to press. The school had been disbanded for the Christmas holidays; a number of the immediate contacts were detained as a precaution. The new cases have occurred among these contacts. The disease in all five boys appears to be mild.

Typhoid Fever

Since December 22, when a secondary case was notified, no further cases of typhoid fever have occurred in the outbreak at Shoreditch; the total now stands at 32—27 in the borough and 5 outside the borough, but presumably belonging to the outbreak. It has been ascertained that the source of infection was a shop employee who handled a variety of foodstuffs at a time when he was suffering from a mild form of the disease of which he was unaware. It is considered that he contracted the infection outside the borough. One of the last patients to be diagnosed had been engaged in the bottling and distribution of milk, but so far no further cases have resulted.

Diphtheria

The notifications of diphtheria in England and Wales have been decreasing for the last three weeks. The disease is, however, still prevalent in South Shields, where high figures obtained during 1938: during the week 40 new cases were notified, and there were 2 deaths in children aged 2 and 4 years respectively. During 1938 in this borough there have been 589 cases and 62 deaths to date. At first school children were mainly affected, but a campaign of immunization amongst them met with considerable success in reducing the incidence of the disease. In recent weeks children under school age have been chiefly attacked, and an appeal has been issued by the public health department to parents of young children to have them inoculated immediately.

Small-pox

An epidemic of small-pox, described as the worst since 1874, has been raging in Shanghai for the past three months, involving some 1,100 cases to date. During the week ended December 24 there were 297 cases and 121 deaths. In the immediately preceding three weeks there were 222, 211, and 339 cases, and 69, 73, and 94 deaths respectively. Of the total number, 85 were foreigners of whom 23 have died, one of them being an engineer of H.M.S. *Suffolk*, in which 8 other cases, all mild, have occurred.

General Mortality in the Great Towns of Germany, England and Wales, and the U.S.A.

According to the *Weekly Epidemiological Record* of the League of Nations, the expected seasonal increase in general mortality during November, 1938, was lower than during the corresponding month of 1937 in the great towns of England and Wales and of Germany, but it was slightly higher in the U.S.A. In England and Wales in the 126 great towns (with a population of about 21 millions) the general mortality rate rose during the month from 10.4 to 10.7 per 1,000 population, compared with a rise from 10.6 to 12.3 in 1937. In the 56 great towns of Germany (each with over 100,000 inhabitants and a total population of about 21 millions) the death rate rose from 10.6 to 11.2 per 1,000 population, as against 11.6 to 12.0 in 1937. In the 88 major towns (with an estimated population of 37 millions) of the U.S.A. the mortality rate rose from 11.2 to 11.4 in November, 1938, compared with 11.2 to 11.3 in the previous year.

No abnormal increase of influenza was recorded in the great towns of any of the three countries during the month.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS.—All communications should be addressed to the Advertisement Manager (office hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are

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SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin.)

QUERIES AND ANSWERS

Gas-and-air Analgesia in Midwifery

Mr. L. CARNAC RIVETT (London, W.1) writes submitting the following answers to Dr. W. A. Clark (December 31, p. 1402). (1) Has any fatality due to the use of gas in childbirth ever occurred? No case has yet been reported in which death was in any way ascribed to the use of gas and air. (2) What damage of any kind has ever been attributable to the use of a Queen Charlotte's gas-and-air apparatus by a woman in labour? I do not know of any case in which any damage has been attributed to the use of a Queen Charlotte's gas-and-air apparatus. (3) What justification is there for the Central Midwives Board's insistence on the presence of (*a*) a specially trained midwife and (*b*) another nursing assistant at the labour of a woman who uses a gas-and-air apparatus for analgesia? It seems rather obvious that before a midwife can use this apparatus on her own initiative and own responsibility she should have had reasonable instruction and experience in its use, and the presence of a second person is insisted on as it is thought that if only one person were present it would be difficult for her to superintend the administration of gas and air and, at the same time, keep sufficiently sterile to conduct the labour, and she might have difficulty in dividing her attention between the perineum and the apparatus.

Income Tax

Life Assurance Relief

"C. D." has recently taken out a life policy, and inquires whether he is entitled to an allowance against the tax (Schedule D) due on January 1.

*** Yes—"C. D." should write to the inspector of taxes enclosing a certificate, to be obtained from the assuring society, setting out particulars of the policy. The allowance will apply to the financial year 1938–9, one-half being given against the January and one-half against the July instalment.

Loss on Property in Scotland

"HOUSE OWNER" became entitled as from January 21, 1938, to a house and cottage in Scotland. The house is let, but the cottage has been empty since Whitsuntide, 1938. Owing to maintenance costs in the past and liability for owner's rates on the empty property, the ownership of the cottage involves him in a loss. Can he claim any allowance for this while the cottage is empty?

*** There is no provision in the Income Tax Acts for relief in such a case, but if the cottage becomes let for a portion of any financial year the owner's rates for the whole of that year can be deducted from the rent receivable for that part during which it was let.

LETTERS, NOTES, ETC.

Sneezing

The snuffbox was handed round at a convivial Christmas dinner meeting of the Hunterian Society, and several "involuntary, audible, and violent emissions of air through the nose"—to quote the definition given—appropriately introduced a discussion on sneezing. Some curious personal experiences were related. A surgeon confessed to repeated attacks of sneezing when driving his car through Berkeley Square; certain holes on a particular golf course affect him in the same way. A sneeze may apparently be restorative. A case was mentioned of persistent hiccough, which only ceased when the patient was given a pinch of snuff, followed by a dig in the ribs, causing him to sneeze. As illustrating the extreme sensitivity of the nasal mucosa one speaker said that some of the "sneezing" gases, such as chloracetopicron, can act in dilutions as high as one in ten million. The discussion ranged over the psychological, rhinological, and allergic field. Dr. George Riddoch said that although the voluntary muscles were employed in sneezing, the fact that it was a reflex mechanism was shown by its preservation in decerebrate animals. Its main purpose was to clear the nose of irritating substances, and if not repeated too often the sensation was distinctly pleasurable. Mr. Hamblen Thomas said that for the more chronic type of sneezing attacks general treatment was as important as local. In many cases, especially those of the vasomotor type, intramuscular injections of calcium had proved beneficial, as had diathermy of the sinuses. Drugs such as local anaesthetics and ephedrine acted temporarily, but exerted a harmful influence on the mucous membrane eventually if continued. The effect of cauterizing the septal tubercles in hay fever cases might last for the year, but it was not permanent. Sometimes submucous resection of the nasal septum high up was indicated to relieve pressure on the turbinates, improve the airway, and possibly desensitize the nerves, and in severe and prolonged sneezing injection of the sphenopalatine ganglion might be required. But, in general, Mr. Thomas deprecated interference in the nose. Finally, Dr. George Bray mentioned a large number of agents which might cause sneezing attacks. These were principally inhalant, such as pollens, dusts, feathers and down, cosmetic powders, animal and even insect emanations, and moles and fungi and their spores. But sensitiveness to certain foods had to be reckoned with. Injections of serum and overdosage of desensitizing solutions or vaccines might cause sneezing, and there were various miscellaneous causes, such as strong lights, east winds, petrol or tobacco fumes, and insect stings.

Moral Rearmament

Dr. DONALD COURT, M.R.C.P. (London, S.W.), writes: May I commend to the notice of your readers a remarkable book which has recently appeared entitled *Moral Rearmament*. It is edited by H. W. Austin, the tennis player, and is published by Heinemann and Co. In its pages leaders of political, social, and scientific thought from many countries point to a line of individual and collective action which may well prove the answer to recurrent crisis. The central appeal is for pioneers who will conquer the lawless forces not of material but of human nature. Surely this is preventive medicine in its widest sense, and therefore worthy of the profession's most careful investigation.

Small-pox and Vaccination in Shanghai

Dr. R. J. MARSHALL writes: In connexion with the report that there have been eighty-six cases of small-pox in Shanghai with twenty-four deaths among the foreign population, it would be interesting to know if any of these cases had been successfully vaccinated within recent years. Small-pox is always prevalent in Shanghai during the winter, but during thirty-five years' residence there as a medical practitioner I did not see one case of small-pox in a person who had been successfully vaccinated within ten years. Doctors in Shanghai place little reliance on any vaccine other than fresh calf lymph as prepared in the Municipal Health Laboratory and accessible to everyone.

The Occipito-posterior Case

Dr. G. LLEWELLYN DAVIES (London, S.W.6) writes: In the absence of obvious signs of maternal or foetal distress, my own feelings of inadequacy in the presence of a case of difficult labour make me cling to the dictum, "Leave it to Nature." A few weeks ago I was called one day, about 3 p.m., to a woman of 42 who was in labour with her seventh child. Labour had started during the night, and strong pains were coming about every three to five minutes when I reached the house. The os, however, was only dilated to about the size of a half-crown, and the tip of the index finger could only with difficulty touch the presenting part. Deciding from my examination that this was an occipito-posterior position of the vertex, I gave the patient 1/6 grain of morphine, with a view to resting her as much as anything. On arrival at home about twenty minutes later I found a message to return immediately, which I did, only to find the baby born, the cord severed, and the nurse busy making the patient comfortable! I might add that my return journey to the house took only five minutes. All of which only goes to confirm what Dr. E. A. Gerrard says in the *Journal* of November 19 (p. 1063) about the sometimes surprising effect of 1/4 grain of morphine.

Locked Twins

Dr. ROBERT R. FOOTE (Maidenhead) writes: I am much interested in the report of locked twins by Dr. J. J. Russell in the *Journal* of December 10 (p. 1205). Two years ago I was sent for by a doctor who had diagnosed the condition of locked twins in a young primipara. The mother had been in labour for about ten hours, and on arrival I found a breech presentation in the process of being born. Examination enabled me to feel a vertex above the brim, the two foetal heads being jammed together, and it was impossible to deliver the first baby by traction. After prolonged manipulation it was found possible to displace the second head upwards, and to allow the birth of the first baby, which was stillborn. Shortly afterwards the second foetus was expelled, being only about 3 lb. in weight and showing no signs of life. I noted in Queen Charlotte's *Obstetrics* that no case had been seen in the experience of that particular institution, but I was completely satisfied that in this particular case the twins were truly locked by means of the two foetal heads. This case is not of the same interest as that of Dr. Russell inasmuch as both babies were born dead.

Papworth Furniture

As many readers know, quite a busy industry is carried on by the inhabitants of Papworth village settlement, and many have no doubt visited Papworth and seen the patients at work. We have received a catalogue illustrating the furniture that is made there for use in hospitals. The pleasant and simple designs in oak might also attract people who wish to add odd pieces of furniture to their own houses. The address of the London offices is 204–206, Great Portland Street, W.1.

Occupational Therapy

We have received the first issue of the *Journal of the Occupational Therapists' Association*, which is to be published quarterly at a price to non-members of 1s. an issue. The purpose of this journal is to bring occupational therapists throughout the country into closer contact with each other and to afford a medium of communication between them. The Editor is Miss N. Ross, 4, Orchard Estate, Cherry hinton, Cambridge.

Diaries and Calendars for 1939

We have received from Messrs. Frederick Aldridge (34, Paternoster Row, London, E.C.4) a copy of their *Hospital Diary* for 1939, compiled by Mr. F. P. Carroll. In addition to the diary proper with its thumb-index there is a section of special interest to hospital officers and those engaged in hospital administration; it includes notes by Mr. Clement Cobbold, Secretary of the Royal Cancer Hospital. There is also an alphabetically arranged guide to hospital suppliers, and fuller particulars of district nursing services are given this year. The price of the diary, bound in leather cloth, gold blocked, is 5s. 6d. post free.

Disclaimer

Dr. A. L. COLLINS writes from s.s. *Helenus*, Hong Kong: My attention has been drawn to an article in a Hong Kong newspaper concerning medical aid which I rendered after boarding another ship near Singapore. The article was written and published without my knowledge or consent, and the writer of the article is personally unknown to me.